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### *DIESEL RAILWAY TRACTION*

*A Supplement illustrating and describing developments in Diesel Railway Traction is presented with each copy of this week's issue.*

### Trunk Road Nationalisation

BEFORE the railway era the turnpike roads and canals were the only arteries for inland transport and the user paid for their upkeep by means of tolls. With the coming of the railway, through traffic passed from the road to the railway, and only after a period of some seventy years began to return with the coming of the motorcar. During the period, as the through road users had virtually ceased to exist, it was only logical that, if there were to be any roads at all, they must be financed by a different method. Thus road ownership and maintenance were transferred to the local authorities and became a charge on the rates. This was eminently fair, as the benefit conferred by the road was entirely local. With the reintroduction of long-distance road transport the position has been changed completely, and the trunk roads now carry a large volume of traffic through localities which have no interest therein. Moreover, it has been found increasingly difficult to secure on uniform principles improvements in layout, surfacing, and signalling, which are necessary for the safety of all classes of road users and the convenience of traffic. The Government has therefore decided to introduce in the autumn legislation to transfer the trunk roads from the County Councils to the Minister of Transport upon whom all responsibilities as highway authority in respect of these roads would in future rest. It may be recalled that, as long ago as August 19, 1932, we advocated the transfer of roads to a Public Roads Authority which would take over the highways and make them self-supporting by reintroducing tolls. Our suggestion was then offered partly with the object of equalising the basis of rail and road competition, and, although that financial aspect is no part of the present scheme, the present proposals of the Government at any rate recognise what we then pointed out, namely, that the fundamental change in road transport in the motor era had made it inexpedient to try adapting the "parochial" legislation of three quarters of a century ago to the national road needs and problems of today.

* * * *

### The Problem of South Wales Depression

A conference on the industrial position in South Wales and Monmouthshire was held at Paddington on Wednesday afternoon, at which Sir Robert Horne, Chairman of the Great Western Railway Company, presided. As he pointed out in his opening address, they were met together to see, whether in the advent of more prosperous industrial conditions throughout the greater part of the country, some flow of prosperity could not be turned into South Wales channels. The core of the South Wales problem was the export of coal, on which its prosperity was built up. The increasing use of oil as fuel, difficulties of exchange, restrictions on import and foreign competition had hit the export coal trade very hard, and political controversies with Italy had injured South Wales more than any other part of the United Kingdom, while, till now, the Government's trade agreements about coal had been, if anything, detrimental to South Wales. The docks of South Wales were not earning enough revenue to meet their running expenses. He thought that an area which was specially hit by national policy should be specially supported by the nation. Larger Government support for the better treatment of coal was necessary, and it was in the power of the Government to place orders in the special areas and to make its contractors similarly place their orders in turn. His own company had during the depression spent an increasing proportion of its receipts in South Wales.

* * * *

### The Week's Traffics

Adjustments in connection with the figures for the half-year were expected to result in the publication of improved returns on the four group railways for the past week, but the traffics were above expectations. For the 27 weeks of the current year the total earnings of the four companies together have reached £76,973,000, an increase of £2,034,000, or 2·71 per cent. This increase is made up of £193,000 from passenger train traffic, of £1,234,500 from merchandise, and of £606,500 from coal.

| | 27th Week | | | | Year to date | |
|---|---|---|---|---|---|---|
| | Pass., &c. | Goods, &c. | Coal, &c. | Total | Inc. or Dec. | |
| | £ | £ | £ | £ | £ | % |
| L.M.S.R. .. | + 79,000 | + 35,000 | + 5,000 | + 119,000 | + 1,056,000 | + 3·48 |
| L.N.E.R. .. | + 16,000 | + 39,000 | + 5,000 | + 60,000 | + 594,000 | + 2·68 |
| G.W.R. .. | + 15,000 | − 2,000 | − 5,000 | + 12,000 | + 275,000 | + 2·20 |
| S.R. .. .. | + 11,000 | + 6,500 | + 6,500 | + 24,000 | + 109,000 | + 1·10 |

London Transport receipts for the first week of its new financial year were £575,800, an increase of £9,700. The Mersey to date shows an advance of £1,126.

* * * *

### "Candlewick Station, London"

According to *The Times* of Monday last, a proposal is being made that Cannon Street shall revert to its ancient name of Candlewick. So far it is impossible to forecast the extent of the support such a scheme will attract, but, with other examples before us (such as York Street reverting to Petty France) it is not outside probability that the change may be made eventually. In that event, the Southern Railway would doubtless follow suit and give us the unusual-sounding but attractive title of "Candlewick Station, London." Actually this change of name

would strengthen the last link with its great mercantile past that Cannon Street has retained, for not every user of the famous thoroughfare recognises in the present military-sounding name a corruption of the original Candlewick Street, the centre of the candle-making trade. Not only has the street many historic associations, but the actual plot of ground on which Cannon Street station now stands is a famous site, for on it stood for centuries the London depot of the powerful trading combine known as the Hanseatic League, a great federation of North German trade guilds. When in 1422 the League sought and obtained extensive trading facilities in the chief British commercial centres, feeling in many quarters grew high and a considerable increase in import duties on foreign goods resulted. Eventually Queen Elizabeth withdrew all the trading facilities from the Hanseatic League excepting the right to retain the Old Steel Yard in Cannon Street, and thus the present railway station occupies what may be considered as the last stronghold in Great Britain of the Hanseatic League.

* * * *

### Leopoldina Railway

Results of working the Leopoldina Railway in the year 1935 were disappointing for reasons beyond the control of the management. Passenger numbers increased by 3·68 per cent. and goods and livestock tonnage by 10·31 per cent., with increased receipts in Brazilian currency of 4·13 per cent. and 3·89 per cent., respectively. Gross receipts, in currency, were 3·16 per cent. higher, but expenses in currency advanced by 23·61 per cent. The Arbitration Tribunal in May, 1934, ordered a general increase in pay to the staff, which was in operation for the whole of 1935, as against six months in 1934. Moreover, the conversion of currency into sterling throughout 1935 was calculated on the free market rate which averaged only 2·209/256d. for the milreis, the lowest on record in the history of the railway, as against the higher official rate used in 1934. In the accompanying table therefore, the money figures do not give a real comparison.

| | 1935 | 1934 |
|---|---|---|
| Passengers | 29,278,287 | 28,240,401 |
| Goods and livestock, tons | 1,744,084 | 1,581,117 |
| Operating ratio, per cent. | 88·62 | 76·38 |
| | £ | £ |
| Passenger receipts | 228,397 | 313,100 |
| Goods and livestock receipts | 607,241 | 845,980 |
| Gross receipts | 961,569 | 1,303,213 |
| Working expenses | 852,172 | 995,330 |
| Net receipts | 109,397 | 307,883 |

After crediting £75,000 transferred from specific reserve and suspense accounts, not now required, and allowing for prior charges, &c., there is a debit balance of £111,033.

* * * *

### Danish State Railways in 1935-36

The total receipts of the Danish State Railways for the year ended March, 1936, amounted to Kr. 113·83 million against 106·3 millions in the preceding year, an increase of 7·6 millions or 7·2 per cent. Receipts from passenger traffic were Kr. 59·8 million or 6·1 millions higher than the year before. Of this increase about Kr. 0·5 million comes from the acquisition of new bus routes, and about 1·0 millions from the Copenhagen suburban electrified lines; also the Lyntog, the high-speed diesel trains, have a considerable part in the increase. Receipts from goods traffic amounted to Kr. 40·9 million, which is practically the same as the year before. The revival in trade and industry was thus nullified by competition from road and water, and by a lockout which lasted 5 weeks. Receipts from postal traffic and other miscellaneous receipts amount to Kr. 13·2 million, or 1·5 millions higher than the preceding year. Working expenses were Kr. 113·3 million against 109·4 millions the year before, an increase of 3·7 per cent. This is due in part to an increase in salaries and wages, as a result of the rise in the general price level, which was responsible for an additional Kr. 1·3 million. Further, the train mileage has been rising, and a considerable sum has been spent upon improving curves on the high-speed routes. The net result of the working is thus a surplus of Kr. 0·5 million against a deficit of 3·0 millions in the preceding year. Depreciation and interest, however, take Kr. 17·6 millions, so that the final result is a deficit of 17·1 millions, a figure which is, however, an improvement of Kr. 2·3 million over last year's.

* * * *

### Communication in Marshalling Yards

The great increase since the war in the mechanisation of marshalling yards has given rise to improved means of communicating instructions to the enginemen of the shunting locomotives. Light, and other kinds of visual signals, whistles, and hooters, have all been used, and in some cases direct electrical communication by third rail or overhead wire, with pick-up equipment on the locomotives, has been seen. The development of wireless has naturally led to its adaptation to this purpose, and both short wave transmission and carrier-current telephony with wires along or near the tracks concerned, have been used. According to a report in the last proceedings of the German Association for Marshalling Yard Engineering, the carrier system has been found to answer best in most cases, and to be cheaper and easier to maintain. The Reichsbahn has several installations in service, and they have assisted to expedite traffic and eliminate mistakes.

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### Buffet Car Facilities

Referring to the description of the Kowloon-Canton Railway buffet car in our issue of May 15, the General Manager informs us that " to conform to custom in the East, several dice boxes are provided to enable drinks to be shaken for." The West, too, is not without its traditional means of appealing to the gods of chance in matters of refreshment. Where no more solemn forms of sustenance are involved than the convivial bun or the heady lemonade, competition for the right to pay does not run high, and our buffet cars do not resound with the angry cries of those who quarrel for the privilege. There are times, however, when libations must be poured in more hallowed fluids. Of one of these we are informed that " not a drop is sold till it's seven years' old "—a quality considered to bestow peculiar immunity from worldly cares upon the purchaser. In such cases recourse might conveniently be had to the western equivalent of the oriental dice box. Chained halfpennies could be provided for settling disputes by the spin of a coin, and, carrying the guarantees of the companies concerned, would be free from those curiosities of minting occasionally met with in circles where this form of arbitration is popular.

* * * *

### The Silver Jubilee

When passing Hitchin on July 2, the Silver Jubilee of the L.N.E.R. completed in a period of just over nine months its first 100,000 miles of running. Of this distance the runs between King's Cross and Darlington, 232·3 miles in each direction booked from start to stop at 70·4 m.p.h., make up a total of 86,567 miles, practically the whole of which has been shouldered by the three engines *Silver Link*, *Quicksilver*, and *Silver Fox*, for the fourth, *Silver King*, is kept at Gateshead as a reserve, and spends most of its time on less inspiring schedules

between York and Edinburgh. Probably the most outstanding feat of endurance was that of *Silver Link*, which, after the epoch-making trial run of September 28 last, when only about three weeks old, began hauling the train in both directions, covering 536·6 miles daily at these speeds until *Quicksilver*, the second engine of the class, was in order for taking over a share of the work nearly three weeks later. The L.N.E.R. claims that since its introduction this famous flyer has covered 18,283 miles at speeds at over 80 m.p.h., but this total seems unduly modest, for in our experience at least 60 miles a trip are covered at over this speed, which in over nine months would make something like 50,000 miles all told. All that it now needed is more accommodation, for such is its popularity that it is difficult now to secure a seat without booking well ahead.

* * * *

### A Fine Speed Exploit

One of the most notable runs in the annals of the London & North Eastern Railway or its predecessors marked the introduction of the summer train service on Monday last. In recovering time that had been lost by a late start, and an out-of-course stop in the early stages of the journey, the driver of one of the earliest batch of Pacifics, without the assistance of streamlining or the benefit of the higher steam pressures now customary, succeeded in maintaining, to within a quarter of a minute, the schedule throughout from Hitchin to Selby of the Silver Jubilee express, notwithstanding the fact that his engine was hauling a train 60 per cent. heavier than the weight of the Silver Jubilee set. Indeed, the Silver Jubilee schedule was bettered by more than 3¼ min. from Grantham to Selby, but it was hardly surprising that with a 395-ton train the 24-min. allowance of the latter flyer from Peterborough over Stoke Summit to Grantham could not be equalled, though 27 min. 21 sec. with such a load in this direction of running was certainly remarkable enough. The upshot of this journey, of which the times and speeds are set out on page 68, was that, although the Scarborough Flyer passed Hitchin over 10½ min. late, it ran into York 5 min. early, and that on a booking of 180 min. for the 188·2 miles.

* * * *

### Recording the Working of Signals

Although it has apparently never attracted much attention in this country, apparatus which furnishes a continuous record of the positions and movements of fixed signals and, occasionally, other appliances, has often been tried abroad. These recorders have taken various forms, some using electro-chemical action to produce the paper record, others inscribing pens. Such apparatus is often useful in settling disputes as to the indication of a signal at a given moment. The Austrian Federal Railways have found them valuable in connection with level crossing warning signals, which are often claimed to have been out of action by vehicle drivers involved in accidents, The recording apparatus, which can show the time the signals change, enables the facts to be established, which is important when legal action is taken. By recording the working of certain signals at stations, disputes between guards and signalmen as to the causes of delay can also be settled, and this too has been found helpful in keeping signalmen alert and ensuring truthful train booking.

* * * *

### Automatic Drilling Speeds

In the operation of the drilling machine, the rate of cutting depends not only upon the material being drilled but also upon the size of drill, since the peripheral speed for a given number of revolutions per minute increases with the diameter of the drill. Hence the choice of the correct speed of rotation is a problem demanding considerable experience. To ensure that this correct speed shall be obtained, a well-known British firm of machine-tool manufacturers has recently placed upon the market an improved type of radial drilling machine provided with a pre-selective gear on the drilling head, by means of which the correct speed for any size of drill working on any of the usual engineering materials is automatically obtained. The machine is separately driven by means of an electric motor carried on the drilling head with a single lever control for starting, stopping and reversing the spindle. At the front of the gearbox is a dial which is rotated until it is brought opposite to the name of the material to be drilled, a lever is then operated until the hole diameter is brought into view when the spindle runs automatically. The drive from the motor is by means of a noiseless vee belt and there are no clutches whatever in the drive. The control of the position of the drilling head on the arm as well as the elevating and lowering of the arm are also arranged on the slide.

* * * *

### Light 4-4-0 Passenger Locomotives, G.W.R.

The Great Western Railway, as we announced last week, is turning out a class of light 4-4-0 passenger locomotives, to be known as the "Earl" class, for use on lines where axle weights are limited but which call for a fairly good tractive effort. These engines, which will be used more particularly over the routes of the former Cambrian Railways, will take the place of a number of those of the "Bulldog" (33xx) and "Devon" (32xx) classes which are being cut up. They have 18 in. × 26 in. cylinders, 5 ft. 8 in. coupled wheels, and a total heating surface of 1,224 sq. ft. to which the superheater contributes only 81 sq. ft. The grate area is 17·2 sq. ft., the maximum axle load 15·8 tons, and at 85 per cent. of the boiler pressure of 180 lb. the tractive effort is 18,955 lb. The total weight of the engine in working order is 49 tons, and of the tender, which carries 3,500 gal. of water and 6 tons coal, 40 tons. We illustrate on page 60 the first of the engines, No. 3200, *Earl of Mount Edgcumbe*, from which it will be observed that the 1936 build does not belie the nineteenth century G.W.R. design —a striking tribute to the efficiency of the latter.

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### Improved Locomotive Outlook in U.S.A.

Our American contemporary, the *Railway Age*, recently published a statement showing that the number of locomotives so far ordered during the present year exceeds that for the whole of 1935. During May, orders were placed for 10 steam locomotives, bringing the 1936 total to date up to 98, including 86 steam locomotives, but excluding power units for four streamlined trains. Throughout the entire twelve months of 1935, only 83 locomotives were ordered, these including 28 steam-propelled units, or less than one-third the number of this type ordered thus far in 1936. In the first five months of 1935 only 13 locomotives, nine steam and four of other types, were contracted for. At the close of May last inquiries for a further 21 steam locomotives were outstanding. A similar situation exists in respect of freight rolling stock. In the first five months of the present year, 22,240 vehicles have been ordered, this representing an excess of 3,541 built for United States railways during the entire period of 1935. Orders for passenger train rolling stock have increased, and the same applies to contracts for rails and other equipment.

XUM

## London Transport—Is it a Success?

LAST week the London Passenger Transport Board completed the third year of its operating life, and by now may be considered as an established transport unit. Necessarily its first task was to take over and weld a large number of separate private and municipal undertakings, and the process has taken longer than was generally expected. The merging process is now complete, however, and therefore the account of his stewardship which Lord Ashfield, the Chairman of the board, gave on Wednesday of last week was most interesting and opportune. His address, presented to a joint meeting of the Conservative Transport Committee and the Greater London Conservative Members' Committee, over which Sir Henry Jackson, M.P., presided, began with the declaration that it would have been impossible for the old order of uncontrolled London passenger transport to continue indefinitely. This statement of the position is almost universally accepted, for not only the Underground group but also all the other transport agencies serving London had virtually exhausted their powers of expansion under the old conditions. During the past three years the board has consolidated some 155 separate transport undertakings and also effected a pooling arrangement with the four main-line railways regarding their suburban services. The total stock of the board now amounts to more than £111,000,000.

In reviewing the work of the past three years, the question naturally arises "Is London Transport a success, and, if not, can it be made one?" Superficially the answer is probably in the affirmative, for Lord Ashfield stated that London today had easily the largest riding public in the world, and during the year ended June 30, 1935, 3,582,000,000 passengers were carried by the London Passenger Transport Board. Incidentally the distribution was as follows: buses 58 per cent.; trams and trolleybuses 29 per cent.; railways 12½ per cent.; and coaches ½ per cent. On the whole, this enormous and concentrated business was conducted satisfactorily and successfully, and it is easy to recall many traffic improvements—both rail and road—which have been made under the management of the London Passenger Transport Board. On the other hand, it is probable that certain of the changes would have taken place in any event under the progressive managements responsible for the chief undertakings before merging. Furthermore, Questions in Parliament and the "Letters to the Editor" columns of the daily press give evidence that public satisfaction is not universal.

The answer to the question is supplied—at any rate in part—by Lord Ashfield's succinct summary of the board's duties. Parliament, he said, had laid down two fundamental conditions, namely, that the board should provide adequate services for the whole area, and that it should secure sufficient revenue to defray all its charges without a subsidy of any kind. In view of the needs of an ever-spreading Metropolis, these conditions are to some extent contradictory and may even prove impossible of permanent fulfilment. If, for example, the board were to increase fares by one-tenth of a penny for each passenger carried during the year, its revenue would be increased by nearly £1,500,000, and this sum would permit of interest being paid on extensive new capital works which could not be immediately productive. Such a course would necessarily prove most unpopular, and in practice has not been attempted. In fact, Lord Ashfield said that, while it had taken some time to straighten out fare anomalies, in very few cases had there been an actual increase of fares; increases had been made only when the low fares had been due to cut-throat competition between rival concerns, and the number of fares which had been reduced was 14,000. The course which the London Passenger Transport Board has adopted has been to attempt to secure better operating ratios in all branches of its business. In part this has resulted in lengthened headways on certain services, and shorter trains at some periods of the day. The effect has been to reintroduce the bus queue in rush hours and at times to increase standing in trains, and these facts account for much of the dissatisfaction which has been voiced.

From the point of view of London Transport the problem is complex. During the ten-year period 1924-1934, the population on the outer fringe of the board's area was stated by Lord Ashfield to have grown by more than 1,000,000, while there had been a diminution of the population in the central area of 350,000. He added that now the board operated in conjunction with the main-line railways it was a matter of indifference where the population lived, as the problem could be surveyed as a whole. This is true only so far as the competitive element is concerned. It is no longer necessary for different undertakings to offer superior attractions of location and facility to entice the househunter to live on a particular system, but the main problem remains unsolved; that is, to convey the daily traveller between work and home at a fare he can afford, and still to cover working and other expenses. In his address from which our statistics are quoted, Lord Ashfield produced graphs showing that the real rush traffic on the underground railways was limited to three-quarters of an hour in the morning and at night. Although so much of this "dormitory" traffic is highly concentrated, and therefore probably not sufficiently remunerative to justify the provision of adequate "rush" facilities which must be idle most of the day, the London Passenger Transport Board has not shirked the attempt to find a "happy medium" within the limits of the present financial structure. Lord Ashfield paid tribute to the Chancellor of the Exchequer for making it possible for the board to raise a loan at so low a rate of interest as 2½ per cent. When the new programme of works was completed the position, he said, would be that since the board was established 12½ miles of new tube railways, 10 miles of surface railways, and nine new stations would have been built; 69 stations would have been reconstructed, 65 new escalators installed, 1,548 new underground cars and 16 new garages built, and 3,527 new buses built; 185 miles of tramways would have been replaced by 1,019 trolleybuses, and in time the remaining 148 miles of tramways would be similarly dealt with. The board would have spent £48,000,000, and to this had to be added the £10,000,000 which the main-line railways were spending on their suburban services.

Last year London Transport received £30,500,000 from the travelling public, and this was disposed of as follows: Salaries and wages, 50 per cent.; licences and petrol duties, 8½ per cent.; fuel consumed, 4½ per cent.; stores and supplies, 11½ per cent.; renewal of fleet, 7½ per cent. The total working expenses thus amounted to 82 per cent., leaving 18 per cent. to pay interest on the various classes of capital. Every bus paid £346 a year to the National Exchequer for licence charges and for the petrol tax. The board employed 78,500 workers compared with the 72,000 who were employed by the old undertakings it took over. Lord Ashfield claimed that the board had made great improvements in the conditions of service of the employees. All the cuts imposed during the financial crisis had been restored, and he paid tribute to the splendid spirit in which the cuts had been faced by the workers. Holidays with pay had been introduced, and the total cost of the benefits which had been granted was about £1,000,000 a year. The average wages of

those on a weekly basis was £4 2s. 3d. a week. Approximately 100 route miles of new bus services had been provided, and there had been a total increase in passenger miles of 36,000,000 a year.

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## Shunting and Siding Rent Charges on Cripple Wagons

THE number of privately-owned railway wagons which can be seen running on the main-line railways bearing a monogram "C.C.," draws attention to an interesting arrangement which has been evolved by the railway companies in association with the various Private Wagon Owners' Associations. The facts are that prior to January, 1924, it was the practice of the companies to charge 1s. a wagon for shunting into and out of railway or wagon repairers' cripple sidings the wagons of private owners which were stopped for repairs, and they also charged 6d. a wagon per diem for siding rent after the expiration of a prescribed free period. The object of the latter charge was to expedite the repair of the crippled wagons and thus relieve the railway sidings from the heavy congestion which was then being experienced owing to the companies being required to stable large numbers of cripples. In 1923, however, differences of opinion arose between the railway companies and the wagon owners as to the commencement of the free period, the former claiming that it should begin from the time wagons were stopped for repairs and the owners advised, while the owners claimed that it should be calculated only from the date upon which the wagons were positioned in a place where the repairs could be executed.

Various deductions were made from the railway companies' accounts in respect of the charges for the disputed free period, and ultimately proceedings were commenced in the Courts between the L.M.S.R. and the Sheffield Coal Company for the recovery of the deductions. During the proceedings it was suggested that the difficulty could probably be surmounted by the introduction of a commuted annual charge covering the services in question, and negotiations were accordingly begun between the interested parties. As the result, the railway companies introduced on January 1, 1924, an experimental arrangement for the payment of a commuted annual charge of 1s. a wagon in lieu of the charges formerly raised for shunting and siding rent on particular wagons stopped for repairs; it was a condition of the scheme that 90 per cent. of the private owners' wagons, including colliery wagons, should be brought into the arrangement. Although the introduction of this commuted charge involved the companies in an immediate and substantial loss of revenue, it was expected that appreciable savings in clerical work would be effected by abolishing the necessity for preparing accounts in respect of individual wagons and also the large amount of correspondence in connection with disputed accounts.

The scheme appealed to the majority of private wagon owners but as, for various reasons, appreciable numbers of wagons were not brought into the scheme, the railway companies were obliged for some years to maintain dual records, thus nullifying materially the anticipated economies. Difficulties were also experienced in the initial stages owing to absence of ready means of determining whether the commuted annual payment had, in fact, been made in respect of particular wagons. Accordingly, as from January 1, 1928, it was mutually agreed by the companies and wagon owners that a small enamelled iron plate should be affixed to both sides of each wagon in respect of which the charge had been paid, thus indicating to all concerned that the wagon was included in the arrangement. These plates were issued by the Railway Clearing House and to facilitate identification, bore the monogram of the letters "C.C." in black on a yellow ground. Subsequently it was agreed that, instead of being plated, certain types of wagons should be stencilled with the same design and colouring. These arrangements, together with the assistance rendered by the various Private Wagon Owners' Associations, materially facilitated the working of the scheme as, since that date, the commuted charge has been paid in respect of considerably more than 90 per cent. of privately-owned wagons and, at the present time, something like 525,000 wagons are covered by the arrangement, to the mutual advantage of railway companies and wagon owners.

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## The Michelin Pneumatic-Tyred Car

BEGINNING in 1931 with a 95 b.h.p. petrol-engined ten-wheeled vehicle with 24 seats, the Michelin pneumatic-tyred railcar has developed within five years to a train of 700 b.h.p. seating 106 passengers and suitable for a maximum service speed of 87 m.p.h. From the passengers' point of view a pneumatic-tyred vehicle represents almost the acme of comfort by reason of the noiseless travel, for it is possible to conduct a conversation in ordinary tones without moving from the most comfortable position. The great defect of vehicles having pneumatic tyres running on steel rails is that the wheel load is limited to about one ton because of the limited area of contact. But the operating advantages resulting from the extraordinarily high rates of acceleration and deceleration which are possible through the high coefficient of friction between rubber and steel are of such a magnitude as to encourage intensive research into the question of a great proportional increase in permissible wheel load.

The 70-odd Michelin cars now in service in various parts of the world have an aggregate mileage of approximately 6,000,000, with a maximum individual mileage approaching a quarter of a million, and the older cars have shown that despite the light weight the maintenance costs are reasonably low. The latest Michelin single-unit car, described elsewhere in this issue, presented several new problems in view of the desiderata of seating a hundred passengers in a single vehicle which would be capable of running in either direction at speeds exceeding 80 m.p.h. Moreover, in the conception of the design it was postulated that a selection of engine types should be possible, but, once decided, these problems led to the further question of just how the 12 necessary axles should be arranged. It was decided eventually that the motive power equipment should be located on a centre bogie to which the body would be attached through long thrust rods and roller contacts. With a resulting body length of nearly 100 ft. it was obvious that the normal form of body construction must be considerably modified, and a form of Warren truss was evolved which gave exceptional strength in conjunction with low weight. Tested with a load of 35 tons, or about three times the normal amount, the body framing showed no permanent deflection. This new 400 b.h.p. Michelin car scales only 25 tons, equivalent to 580 lb. per seat and 16 b.h.p. per ton of tare, and the characteristics are such as to enable the car to work either in express or semi-fast services. Further modifications in the latest Michelin standard practice are the incorporation of Vulcan-Sinclair fluid couplings (for the manufacture of which Michelin has acquired a licence) and Cotal electromagnetic gearboxes.

XUM

# LETTERS TO THE EDITOR

*(The Editor is not responsible for the opinions of correspondents)*

## The Brunels

Kent House, Knightsbridge, S.W.
July 7

To the Editor of The Railway Gazette

Sir,—As I am collecting material in connection with the lives of Sir Marc Isambard Brunel and Isambard Kingdom Brunel—my great-grandfather and my grandfather—I should be very grateful for the loan of correspondence or papers relating to them which may be in possession of any of your readers. Such letters will be carefully handled and returned by registered post.

I am, &c.,
CELIA BRUNEL NOBLE

## London to Ilfracombe

60a, Green Lane, Northwood.
July 4

To the Editor of The Railway Gazette

Sir,—In your issue of July 3 you refer to the improved timing of the Southern Railway's best express from Waterloo to Ilfracombe in the new summer service, the journey being done in 4 hr. 57 min. It is interesting to note that as far back as the summer of 1906 the Great Western Railway put on an express that was timed to reach Ilfracombe from Paddington in 4 hr. 55 min. It consisted of a coach, or coaches, slipped at Taunton off the 3.30 p.m. Paddington-Plymouth express, which ran by the recently opened Westbury route. A coach for Barnstaple (G.W.R.) was added at Taunton and the train, a very light one, was run non-stop to the Barnstaple Loop box, where this coach was taken off. The Ilfracombe coaches went on to Barnstaple Junction, from which they were worked by the London & South Western Railway to Ilfracombe. This summer's timetable shows that the Great Western Railway has, on Fridays and Saturdays, a train timed to reach Ilfracombe from Paddington in 4 hr. 50 min. This is a record timing between London and Ilfracombe; the train leaves Paddington at 12.5 p.m.

Your obedient servant,
REGINALD B. FELLOWS

## Riding Qualities of Passenger Coaches

55, Kingsdown Parade, Cotham,
Bristol, 6, July 5

To the Editor of The Railway Gazette

Sir,—Your issue of May 29 contained an interesting reference to the riding qualities of passenger coaches. It has often passed through my mind that there is no means by which views of the travelling public upon the coaches in which they ride can be obtained, and I am glad to see the point referred to in print.

As one who travels considerable mileage by rail in this country, I often hear from the lips of "seasoned" travellers comment of an interesting nature. Quite recently I was riding in the last vehicle of an express descending Beattock bank. The vehicle was of the latest pattern and "rolled" freely from side to side ("alarmingly" as the penny press might say). The motion was distinctly unpleasant and one or two passengers were actualy apprehensive of their safety. Still more recently I experienced the same motion descending from Glenfarg to Bridge of Earn whilst riding in the centre of the train.

Vibration, however, probably causes more annoyance to the ordinary passenger as it often prevents reading or relaxation. From my observations this vibration is not confined to the older vehicles in use; in fact many of the vehicles constructed since about 1930 have distinctly more vibration over given sections of the various companies' lines than the older and (by appearance) more "solid" stock of pre-war days. Nor is this vibration only noticeable at high speed, often it is at its worst from 50 to 60 m.p.h.

Regular travellers notice these details and could, I think, furnish some quite useful hints to the companies concerned. In the ordinary course vibration and tendency to "roll" would not come under observation of the appropriate officials unless very frequent tests of stock actually in service were made over the principal routes.

Yours faithfully,
C. R. CLINKER

## Colour-Light Signals

The Malt House, Gillingham,
Dorset. July 6

To the Editor of The Railway Gazette

Sir,—I venture to disagree with the present use of the yellow and double yellow aspects. I submit that one yellow should mean: "Proceed with caution, prepared to stop at signal *not less* than full braking distance ahead"; and that the double yellow should mean: "Proceed with *double* caution, prepared to stop at signal *less* than full braking distance ahead."

By this means the single yellow aspect would always tell the driver that he had a reasonable distance in which to stop his train, whether out in the open country or in a congested area, while the double yellow aspect would warn him to expect a red aspect quite a short distance ahead. Two yellows show up better than one, and should therefore be used to indicate the greater need for caution. I do not agree that one yellow should mean: "Proceed, prepared to stop at *next signal*," as it gives no indication as to how far ahead the next signal is.

Yours faithfully,
T. W. BEST

[There has been much discussion, especially in the U.S.A., as to the practicability of giving signal aspects which shall invariably have the same meaning in terms of braking distance, and methods of emphasising that the stop signal ahead is at less than full braking distance have been used in some places. The reason why the double yellow has been used in the way now seen in Great Britain is to ensure that the accidental extinction, or obscuring, of one light shall produce a more, and not a less, restrictive indication.—Ed. *R.G.*]

## The Bristol & Exeter Railway

Cape Town, June 27

To the Editor of The Railway Gazette

Sir,—I notice with interest that, in your issue of May 15, you gave a brief outline of the history of the old Bristol & Exeter Railway as the centenary of its incorporation fell during the following week.

Despite the fact that the Bristol & Exeter Railway was a prosperous and well-managed concern, it was not generally popular with the travelling public, as fares were thought specially high compared with those of other railways. It is not surprising, therefore, that at the date of the amalgamation some wag wrote the following obituary:—

The Bristol & Exeter's Epitaph

Here lies, from malediction free,
The niggard, grasping B. and E.;
High fares and bad accommodation
Made it renown'd throughout the nation:
In life its customers it bled,
And o'er its grave no tears are shed,
Save such as kind folks will be venting,
When their foes die without repenting.

JUBILATE

*Bath, October* 20, 1876.

Although the undertaking was absorbed by the G.W.R. sixty years ago (I write this letter on the anniversary of the date the Amalgamation Act was passed), the old name survived in the West Country for many years, and I well remember it being used up to the turn of the century.

Yours faithfully,
H. BAULCH

# PUBLICATIONS RECEIVED

**Gradients of the British Main Line Railways.** London : The Railway Publishing Co. Ltd., 33, Tothill Street, S.W.1. 9½ in. × 6½ in. 90 pp. Semi-stiff covers. Price 5s. net.—For some time past there have been frequent requests that the gradient profiles, covering nearly 9,000 route miles of the principal main and subsidiary lines of the British railways, which appeared in a series of articles in our associated contemporary, *The Railway Magazine*, in 1929 and 1930, should be reprinted in a single volume. The work under review is designed to gratify these requests by providing a pocket book at a modest price. Most important among the special features of the collection, which was originally made by Mr. Cecil J. Allen, M.Inst.T., is that a uniform scale of inclination has been adopted throughout, which enables the user to form an impression at a glance of the relative difficulty of any particular route. Moreover, information is given on each profile as to service slacks, colliery areas where pitfall slacks may reduce speeds, single line sections, and so on. Information is also given as to the location of the mileposts over the principal routes, and the zero points from which they are measured. These details should facilitate the use of each profile in connection with train timing. A comprehensive index is provided and, to enable quick reference, the gradients of each railway are on a paper of distinctive tint.

**Famous British Trains.** By R. Barnard Way. 1936. London : Ivor Nicholson & Watson Limited, 7, Paternoster Row, E.C.4. 10 in. × 7½ in. 232 pp. Illustrated. Price 5s. net.—Mr. Barnard Way has a style as apparently effortless to the reader as should be the work of the locomotives to the passengers on the expresses he describes. His chapters slip gently into their stride, and are soon galloping breezily and observantly along, carrying one away partly by an exhilarating sense of motion, and partly by the variety of their comments on topography, history, railway practice, and anything else that occurs to the author. We recommend this book to all who have hitherto had to content themselves with a time-table and the exercise of their own imaginations when denied the opportunity of travel in person. All who can still derive a simple pleasure from the sense of motion, and from the prestige that is attached to the status of passenger in a famous British express, will read Mr. Way's book with relish. His observations, however, are more catholic in scope than accurate in matters of railway detail. Some of his facts—though not many—cannot be admitted even under his own proviso that they applied at the date of going to press. These mistakes are not confined to matters of schedule, but extend to points of railway geography and the formation of trains.

The trains of which the journeys and associations are surveyed are the named expresses of Great Britain, including cross-country services. Illustrations are abundant, and some of them are purely scenic. The many train views are well chosen. It was a sensible idea to include in the index references to all the towns and natural features mentioned, as well as to the railway aspects of the book. The train times and other service data are those applying at the time of going to press, but a book such as this, which is designed to woo the interest of the ordinary traveller as much as to satisfy the railway enthusiast, will lose little of its appeal as changes come about.

**Loco's of "The Royal Road."** By W. G. Chapman. London : The Great Western Railway, Paddington Station. 7¼ in. by 4¾ in. 232 pp. Paper covers. Illustrated. Price 1s. 0d. net.—Mr. W. G. Chapman, who is well-known for his books for "boys of all ages," has chosen a good subject for this his seventh such work. His title is also well chosen. A royal mandate, the title of "the royal road" gives a glamour to the Great Western Railway which is substantiated by a century of achievement. The book is divided into a series of what the author chooses to call "talks" rather than chapters, written in an intimate and informative style. Tradition dies hard on the Great Western, and all through the story of its locomotive development there seems to be some essential characteristic which is passed on, as in a family, from one generation to another. The fact that Swindon has remained alone the birthplace of the railway's locomotives amid all the amalgamations, including those of 1922, explains the very intimate link that seems to join the products of the early broad-gauge era with those of 1936. Mr. Chapman traces this development admirably with text and illustrations through eleven talks. The remaining seven talks are devoted to more general matters. Tractive effort and classification, for instance, are explained, and the building and working of a modern locomotive is described. In the latter pages use is made not only of photographic illustrations but also of explanatory diagrams. A folding coloured plate of a King class locomotive, showing all the working parts, forms an appropriate frontispiece.

**Canadian National Holiday Booklets.**—From the Canadian National Railways, whose European head office is at 17-19 Cockspur Street, London, S.W.1, we have received a schedule of sea and inland tours, and descriptive booklets dealing with various holiday areas in Canada. Several of the itineraries are arranged in conjunction with the sailings of the *Queen Mary*. With tourist class on the liner, the inclusive cost of such a tour, allowing six days of sightseeing and travel on the American continent, is £59 10s. By other ships, travellers from this country can start their journeys from Glasgow or Liverpool. A list of summer excursion rail fares from Montreal and Quebec, and of ordinary first class fares from Montreal, Quebec, Halifax, and St. John, are included at the end of the booklet. The other booklets are entitled "Playgrounds in Ontario," "Historic Quebec," "Canada's Maritime Provinces," and "Canadian Rockies and the Pacific Coast." All are abundantly illustrated, and have large, coloured, folding maps.

**Vacances P.L.M., Eté, 1936.**—This French holiday booklet comes like a breath of fresh air from the south of France. The novel cover is gay with all the appurtenances of a P.L.M. holiday such as a broad-rimmed sun hat, a brightly-coloured beach ball, and the equipment of a mountaineer. Inside, the arrangement is equally attractive and just as novel. By making some leaves of double width fold back on themselves it has been possible to include a mass of invaluable information inside the folds and devote the exposed sides almost entirely to illustrations, thus giving a predominantly pictorial impression. At the same time the double-spread arrangement of illustrations has been used with fine effect. For instance, the Mediterranean seaside resorts are shown marked along a coastline etched out against a sea scintillating with dancing sunlight. Snow-clad mountain pinnacles likewise draw attention to the attractions of a climbing holiday in the Savoy. There is also an invitation to the invalid to take heart and visit one of the many spas in the Vichy and Aix-les-Bains district. Numerous small maps are included to show the scope of suggested tours, and each holiday or health resort is carefully classified, code-letters indicating the facilities provided.

**A Magnesium Alloy.**—Magnuminium 266 is an alloy of which we have received particulars from Magnesium Castings & Products Limited, Slough. The data sheet before us deals with it in the form of extruded bars, sections, and tubes, and gives a list of physical properties. Magnuminium conforms to Air Ministry specification D.T.D. 259, and combines high strength with low specific gravity. Great saving of weight can be effected in built-up structures by its judicious use.

**Tool and Die Steels.**—Thomas Firth & John Brown Limited, Atlas and Norfolk Works, Sheffield, has produced an illustrated catalogue setting out the characteristics of the firm's well-known ranges of tool and die steels, and showing them being used for the various purposes for which they are specially available. Carbon, high speed, and alloy steels are included in the survey. A table at the end of the catalogue lists alphabetically the duties for which the different brands are recommended. With the publication is given a useful insert of indications regarding hardening and tempering of the various steels.

# THE SCRAP HEAP

Conductor: "Elgin Avenue! Elgin Avenue!" (pronouncing the "g" soft).

Passenger: "You will excuse my mentioning it, conductor, but the correct pronunciation of that word is 'Elgin,' with the 'g' hard, as in 'gun.'"

Conductor: "Oh, gin's good enough for the people abaht 'ere."—*From "The New Zealand Railways Magazine."*

* * *

Eighty-five years ago last week a train on its way from Brighton to Lewes was derailed at Newmarket Hill. A sleeper had been put on the rails. Four people were killed. A 10-year-old shepherd boy was charged with placing sleeper there, tried at assizes, acquitted. Exactly a year afterwards, on the same day, at the same time, at the same place, the boy, Bokes by name, was killed by lightning.—*From the "Daily Express."*

* * *

JULY 1.—It is unusual for one single passenger to be allowed to hold up a train for half an hour or so, but I saw it happen this week, and the scene was not some little wayside station—but one of the main London terminals. Needless to say the passenger was a lady, an attractive chestnut mare whose wish to remain in London was stronger than the desires of her escort to convey her elsewhere. She trotted elegantly up the platform accompanied by two grooms and two railway porters, and trotted back again, completely ignoring the open door of the horse van and the efforts of her attendants to wheedle her into it. The grooms patted her and fed her and coaxed her and pushed her; the porters tried persuasion at a distance, while a swelling crowd watched the four-to-one struggle with great gusto. The mare gave way in the end, but not until she had held up a main-line train for fully thirty minutes. I wonder what the official explanation of the delay will be.—*From the "Manchester Guardian Commercial."*

* * *

A LETTER FROM A TRAVEL AGENT

"I wonder whether you have already booked with us and still have your holiday in front of you. If so, may I just send you best wishes for a very happy time and may I be fortunate enough to meet you somewhere on the Continent.

"If, perchance, you still haven't made up your mind, can I help you do it? This year is really an amazing one for us; bookings pour in by every post and extra accommodation has had to be secured at many places. Actually, I'm just off to inspect several more hotels in Switzerland and Belgium; so if you haven't yet booked and are thinking of doing so, please do it just as soon as you possibly can. Delay may mean disappointment for you and I always hate people being disappointed!

"Our staff would join me, too, in personal good wishes. Although they often stay late to finish off the days' work, you never saw such a happy team, all pulling their best to give you a happy time—and we hope and believe we shall succeed."

*The menu card issued on the occasion of a special trip from Clermont-Ferrand to Tarbes with the new Michelin 400-b.h.p. car.* (*See pp.* 41 *and* 52)

## One Hundred Years Ago

*Extracts from the July, 1836, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE*

A late number of the *Courrier Belge* stated, that upon the occasion of the opening of the iron railroad between Antwerp and Brussels, the Dutch police issued a notice to the inhabitants of the frontiers, threatening them with a fine of 10 florins each if they ventured to go and witness the ceremony.

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*South-Eastern Dover Railway, and Kent Railway.*—The unopposed progress of the South-Eastern Railway Bill through the Lords was the result, we learn, of an understanding with the Kent Railway Company. The latter will now, it is believed, be permitted to carry a line unimpeded through the populous towns of Dartford, Gravesend, Strood, Rochester, Chatham, Faversham, and Canterbury, to Ramsgate, with branches to Maidstone, Sheerness, Sandwich, and Deal. The South-Eastern, on the other hand, will enjoy their traffic uninterruptedly through the Weald of Kent to Dover, and thus each part of the county will have its line without exposing the companies to vexatious opposition, and its necessary consequence, an immense expenditure of money. The arrangement now come to is precisely what the Editor of this work earnestly urged and recommended to both companies in the beginning of the contest in the Commons.

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*The Great Western Railway.*—The works for the Great Western Railway are now commenced in several parts of the proposed line. Upwards of 100 workmen have just commenced their labours in the neighbourhood of Corsham, and near the village of Box, Wilts; their wages are from 14s. to 20s. a week, an advance in the amount of wages within a very short period of at least one-third!—*From the "Morning Herald."*

*Merthyr and Cardiff Railway.*—There is a drag affixed to the Merthyr and Cardiff Railway, which, unless it can be explained satisfactorily, will continue to excite the surprise and disappointment of all who feel an interest in railway transit. We mean the clause which limits the maximum of—we will not call it *speed*, but a snail's gallop—to *twelve* miles an hour. This is tying up the legs of a giant with a vengeance, and what "should be great" is seemingly "turned to farce." Why, in a few years a broad-wheeled fly-wagon will attain this Parliament speed. Twelve miles an hour! the thing is a contradiction in terms! the provision would hardly be exceeded in absurdity if it had directed that the locomotive engine should move crab-fashion. We really consider the bill more than half-neutralised by this clause, and we are sure that the proprietors will never be satisfied until this obnoxious provision has been repealed. An outlay of hundreds of thousands of pounds to be permitted to travel twelve miles an hour by steam!—Preposterous!—*From the "Chester Courant."*

# OVERSEAS RAILWAY AFFAIRS

*(From our special correspondents)*

## ARGENTINA

### Paving Level Crossings

For some time past the question as to whose is the responsibility for the paving of level crossings, which have multiplied since the initiation of the national road-building scheme, has been the subject of dispute and consequent litigation between the railway companies and the National Roads Board, each side maintaining that the work should be done and paid for by the other party. As a result of these conflicting views, many level crossings, both in the vicinity of Buenos Aires and in outside districts, have been left unpaved, pending a legal decision on the question at issue. As the outcome of an informal discussion at a luncheon, at which the Minister of Public Works (Dr. Manuel R. Alvarado), the Directors of the Roads Board and the legal representatives of the railways were present, it was arranged (with the approval of the Government) that the Roads Board should proceed with the work of paving all the level crossings, and meanwhile a single test case would be submitted to the Federal Court, the parties agreeing to accept the judgment of the Court as final, the costs to be defrayed by the loser.

### Transport and Engineering Meetings

The opening meeting of the current session of the Argentine and River Plate Centre of the Institute of Transport was held in Buenos Aires on May 29, when the Chairman, Mr. J. G. Mayne, M.Inst.T. (Managing Director, Percy Grant & Co. Ltd.) delivered his inaugural address on "Containers." The Chairman referred to the fact that containers were extensively used with great success throughout Europe and in many parts of the U.S.A. They had been in general use in Great Britain since before the war, and since January, 1928, the British railways had adopted them in general practice. Mr. Mayne specially advocated their adoption in Argentina on the grounds of their advantages for the economical and speedy transhipment of merchandise between railways with different gauges. The Chairman surmised that in Argentina, where railway equipment was being standardised, the use of containers, wherever practical, should prove a boon to many engaged in transportation. A general discussion then ensued, at the termination of which the Chairman was accorded a hearty vote of thanks for his address.

A meeting of the River Plate Branch of the Institution of Mechanical Engineers was held in Buenos Aires on June 1, when Dr. H. T. Haworth, M.Sc., B.Eng., delivered an interesting address on "Diesels and Transmissions," illustrated by a large number of lantern slides of the internal mechanism of various types of diesel engine. The lecture, which was of a highly technical character, was followed by a discussion, and at the conclusion Dr. Haworth was the recipient of a hearty vote of thanks.

## VICTORIA

### New Streamlined Air-Conditioned Steam Train

The Government Railways workshops at Newport are at present busy constructing a new streamlined air-conditioned 12-coach train for the Melbourne-Sydney express service, at an estimated cost of £180,000. The ten passenger cars and two vans will be air-conditioned throughout, and the streamlining entails flush windows and doors, and covering over the gaps between the vehicles. The work is already well in hand, and the interior of the train will contain many luxuries, as it is modelled on the Abraham Lincoln train of the B. & O.RR. in the United States.

No new locomotives are to be built for this service, but it is claimed that the power of the standard Pacifics has been increased by about 40 per cent., by the front-end and other improvements previously referred to in these columns, at a cost of only £140 per engine. Some of these engines are however to be streamlined, and it is expected that, when they go into service, this train will be able to reduce the Melbourne-Sydney time by half-an-hour.

## NEW ZEALAND

### The First of the New Railcars

On June 1 public trial runs were made in the Wellington area with the first of the new six-wheel railcars intended for the Wellington-Palmerston North service. Built in the railway workshops, this car—as previously recorded—is arranged to run in one direction only, except during shunting when a reverse gear is brought into use. A six-cylinder Leyland engine and that firm's torque converter and remote control are fitted. The car is 50 ft. in length and has a 9 ft. width at the waist.

There are 49 chromium-plated tubular-framed bucket seats, and heating is provided in the form of hot air circulated by electric fans in combination with special roof ventilation: there is a luggage compartment in addition to a baggage container under the car at the rear. Every comfort is provided, including wireless. In order to work over the tortuous Rimutaka incline, with its 1 in 14 gradient, the wheelbase has been kept short, and there is a 10 ft. overhang at each end. In the larger 56-seater cars for the New Plymouth service most of this overhang will be eliminated.

## UNITED STATES

### Co-ordinator's Post Lapses

The term of office of Federal Co-ordinator of Transportation, ably filled by Interstate Commerce Commissioner Joseph B. Eastman, expired on June 16. This post was created by Congress in 1933 in the Emergency Transportation Act of that year, to last for two years, and later was extended, but efforts to secure a further extension at the present session of Congress were fruitless. The Co-ordinator's principal duties, were (1) examination of projects for joint working of terminals and other co-ordination schemes, which he was empowered to demand despite railway opposition; and (2) research into transport problems and the recommendation of any legislation he considered necessary to improve transport conditions.

### The Functions of the Co-ordinator

The first function was made impossible of performance by a provision in the Emergency Transportation Act which forbade the dismissal of employees in carrying out any such scheme. So the Co-ordinator's work was limited to recommending legislation and engaging in sundry research projects. Recently however, the railways and the railway labour organisations concluded an agreement for the payment of dismissal compensation to employees discharged in the carrying out of co-ordination schemes, and since that time both parties have joined in opposing a continuance of the Co-ordinator's post, particularly since Mr. Eastman became increasingly outspoken in opposition to the "make work" policies of the unions.

Tangibly, though there may be little to show for the three years of indefatigable work by Mr. Eastman and his staff, he undoubtedly did much to bring about legislation for the regulation of motor transport by the Interstate Commerce Commission, and he also did all he could to secure similar regulation of water transport. Mr. Eastman enjoys a reputation of complete impartiality and detachment, and so his advocacy carried far greater authority with the President and the public than anything the railways might assert, since such claims, however sound, are always discounted when put forward by a party at interest.

It is difficult to assign a value to his staff's many great researches into complex railway problems, such as the handling of less-than-carload traffic, car load traffic and passenger traffic; the

potential availability of containers; the status of commercial and scientific research by the railways; car pooling; cost finding, and many others. The railways for the most part disagree with the recommendations made in the Eastman reports, but, nevertheless, thanks to these studies, they now have facts available instead of guess work.

### Lower Fares Apparently a Great Success

Several of the Eastern lines have already disclosed surprisingly heartening experiences of the reduced fares. The New York Central reports an increase in gross passenger revenues of 2½ per cent. over last year, in the first two weeks of the reduced rates, the Baltimore & Ohio has enjoyed a revenue increase of 28 per cent. and the Lackawanna Railroad of no less than 50 per cent. While it is true that these improvements may represent a fillip of extra travel occasioned by postponement of journeys by many persons waiting for the inauguration of the reduced rates, still it is evident that public interest in rail transport has now been aroused, and that results may be expected to be more favourable than anyone would have dared to hope a month ago.

## FRANCE

### Increase in Traffic Receipts

Traffic receipts have recently shown an intermittent tendency to increase in comparison with the previous year. In the latest returns, giving the figures for the week May 27 to June 2, this expansion is further confirmed. The total increase is fr. 23 million or 12·79 per cent., compared with the same week last year. It may be noted, however, that the week included the Whitsun holiday, when fine weather and cheap fares induced great numbers of people to travel. Passenger fares, in fact, increased by fr. 20,081,000, or 40·57 per cent. more than a year ago. But at the same time the goods traffic rose by fr. 2,941,000, or 2.25 per cent. For the first time in a long period all the six chief railway systems recorded increases, some being of substantial amounts, notably that of the Est, with nearly fr. 5½ million, or over 21 per cent. As a result of the strikes, the next returns will probably be less favourable.

Taking the total receipts for the 22 weeks of this year to June 2, however, all the railways still show declines in comparison with 1935. The figures in thousands of francs are as follow:—

| | Receipts January 1 to June 2 | Decreases from 1935 Total | Per cent. per km. |
|---|---|---|---|
| Alsace-Lorraine | 255,125 | 21,550 | 7·27 |
| Est ... ... | 546,909 | 1,331 | 0·24 |
| Etat ... ... | 610,374 | 7,303 | 1·18 |
| Nord ... ... | 600,050 | 8,726 | 1·43 |
| P.O.-Midi ... | 781,642 | 16,090 | 2·02 |
| P.L.M. ... ... | 1,081,640 | 12,410 | 1·13 |
| Totals ... | 3,875,740 | 67,410 | 1·68 |

Total receipts this year to June 2 are thus fr. 67½ million, or 1·68 per cent., less than last year. Other official figures show that the passenger receipts are down by fr. 15,041,000, or 1·59 per cent., and the goods traffic returns are lower by fr. 52,319,000, or 1·75 per cent.

The number of wagons loaded during the 22nd week of 1936 was 0·75 per cent. below that of 1935. But the number loaded from January 1 to June 2 in 1936 was 6,165,973, against 6,110,823 in 1935, an increase of 0·90 per cent. for the 22 weeks.

## SWITZERLAND

### The Reorganisation Problem

In an address at the general meeting of the Swiss Tourist Federation (Fédération Suisse du Tourisme) at Lucerne on June 21, Federal Councillor Pilet-Golaz, head of the Railways and Post-Office Department, outlined the present position with regard to the proposed financial reorganisation of the Federal Railways. Referring to the question of regulating road traffic, M. Pilet-Golaz stated that adequate control was a *sine qua non* condition for the railways, both Federal and private, to enable them to carry on in a normal way, once they had been assisted to financial stability, as otherwise the effort would have merely temporary effects. He stressed the fact that most of the private railways—the Lötschberg, Rhaetian, Montreux-Oberland, and Süd-Ost, to mention but a few—were in at least as unfavourable a financial situation as the Federal Railways, which clearly showed that the present state of affairs was not due to faulty administration, as was generally believed by the public.

### Debt Due to High Construction Cost in Mountainous Country

The ever-increasing debt, the speaker said, was mainly caused by the inevitably high cost of railway construction in Switzerland and the fact that insufficient provision for depreciation had been made. To support this contention he compared the Federal Railways with other European systems, quoting interesting figures to show that, though the debt per kilometre of line was over three times higher in Switzerland than on the French railways, for instance, the system was efficiently and economically worked, the operating coefficient being less than 80 per cent. as against 95·4 per cent. on the Reichsbahn, 96·4 per cent. on the Belgian railways, and over 100 per cent. on several other systems.

### Losses to Road Transport

One of the chief causes of the decline in receipts was that the most remunerative traffic, both passenger and goods, had gone to the roads, whereas the railways were left to handle goods at low agreed charges, and only workmen's and cheap short-distance passenger traffic. This was proved by the fact that, although there was actually an increase in the tonnage transported during 1935, the receipts from goods traffic decreased for the same year. As regards passenger traffic, M. Pilet-Golaz mentioned that last year some 60 per cent. of the passengers held tickets at specially reduced rates—such as family, week-end and party tickets—and that second class travel had shown a considerable falling off and first class was hardly ever used.

### New Show Train

A new show train, on similar lines to the one which toured the country during the summer of 1934, left Zurich on May 2 for a three months' trip, during which it will be on exhibition at 72 stations. The first train consisted of open-platform coaches, painted bright red. This year's train is greatly improved in many respects; it is made up of ten silver-grey vestibuled coaches, including two which are transformed dining-cars of the old clerestory pattern. A covered goods wagon is attached, containing a Saurer diesel engine for producing power in connection with the various exhibits. The train is worked by a co-operative organisation with headquarters at Zurich.

### Signalling Changes

The double-white aspect for the "off" position of distant signals at night will disappear next autumn, to be replaced by double-green. The latter was formerly the aspect for distant signals when the home signal was at "danger," but two orange lights were substituted in February, 1935, as was recorded in THE RAILWAY GAZETTE for March 8, 1935. Two white lights were temporarily retained for "off" in order that the transition should not be too abrupt, but the disc signals are now being fitted with a device which will bring green spectacles before the two white lights when the signal is tipped back in the "off" position. The actual change-over is not to be made before September for these signals, but all new colour-light signals have shown two green lights for "off" for some time past.

### Federal Railways Developments

The new Zurich-Geneva business expresses, to which reference has already been made in THE RAILWAY GAZETTE, are proving very successful, especially between Zurich and Berne, and trials have been made with a view to providing a fourth coach on each train. The standard formation of these limited trains is a 2-C-1 electric locomotive specially adapted for high-speed running, a six-wheeled van and three bogie coaches. The luggage vans for these services are fitted with a small kitchen from which breakfast or light refreshments are served throughout the train, the catering being in the hands of the Swiss Dining Car Company.

In connection with the improvements

to the Lucerne station approaches, an intermediate block station is being provided between Lucerne and Fluhmühle junction, with colour-light signalling. A new connection between the goods station at Zurich and the Oerlikon and Rapperswil lines is under construction, and considerable progress has been made in the alterations to the passenger and goods lines between Basle and Muttenz, difficult work being involved by the reconstruction of a viaduct.

## IRISH FREE STATE

### Passenger Stock Developments

A new type of suburban steel-panelled coach has been placed in service between Dublin, Dun Laoghaire, and Bray, G.S.R. It is of the open central gangway pattern with two end and two central doors, but has no connections between vehicles. Rails with straps for strap-hangers are provided down the gangways. The upholstery is rubber padded as in the latest main line stock. The windows are large, with sliding ventilators above them, and at present two thirds and one brake-third are running out of a total of 12 vehicles on order. Of these the composites are being built with side corridors, however.

G.S.R. coach No. 1304 a gas-lit side-corridor bogie third has had a pantry and kitchenette fitted up at one end for serving light refreshments, including such simple hot meals as eggs and bacon or small grills. It is in service between Waterford and Maryboro' and does two double trips daily.

### Westland Row Alterations

The down platform at Westland Row station has been extended, presumably to accommodate trains from the Midland Great Western section, which are said to be going to use this station from October next onwards. A new roof has been completed to replace the one damaged by a gale last winter and an illuminated train indicator has been erected to show the stops of down trains.

## CHINA

### The Yunnan Railway

The draft agreement concluded between the Ministry of Railways and the French Colonial authorities in Indo-China for the revision of the Yunnan Railway contract of 1903 was approved by the Executive Yuan on May 19. Before discussing the agreement, it may be recalled that the Yunnan Railway, which runs from the navigable estuary of the Red River in Annan through most difficult mountains and malarial country to Yunnanfu, the capital of the westernmost province of China, was constructed to metre gauge and is worked by the French under Chinese concession. Incidentally it was probably one of the most costly pieces of railway engineering work, in lives and in money, ever undertaken in an undeveloped country.

The agreement provides for several new features, notably the appointment of a Chinese adviser or liaison officer between the railway administration and the Yunnan provincial Government. In future the railway will share with that Government the cost of policing the line and will provide educational facilities for its staff. The privilege of exemption from taxation hitherto enjoyed by all employees of the railway will henceforth be limited to goods imported into Yunnan for the use of the railway only. It may be remembered that the western frontier of Yunnan marches for hundreds of miles with Burma and the Shan States, and that a joint boundary commission is at present engaged in demarcating the frontier line.

### New Lung-Hai Rolling Stock

A consignment of 95 freight cars ordered from Belgium by the Lung-Hai Railway has now arrived at Hsuchow. In addition the m.v. *Belpareil* arrived at Woosung (Shanghai) on May 17 with the largest shipment of complete rolling stock ever discharged at a China port. It included 27 all-steel passenger cars supplied through the Compagnie Général de Chemins de Fer et de Tramways en Chine for the Lung-Hai line, and 20 locomotives for other railways. The 27 passenger cars are part of an order placed through that firm for five complete trains, and including five first class sleeping cars, seven second class sleeping cars, five second-third class composites, five postal vans, five dining cars, fifteen third class and two saloon cars, and five luggage vans, a total of 49 vehicles. This up-to-date stock is arriving fully erected ready for despatch by rail to Hsuchow: it will be used on the Hsuchow-Sian service, as from July 1.

### Other Orders

The 20 locomotives are stated to be ten British-built engines ordered through the Purchasing Commission of the Ministry of Railways in London, and the other ten are Belgian-built and ordered through the same firm as the Lung-Hai coaches, but are for the Peiping-Hankow Railway.

Eight more 4-8-4 locomotives were expected to be despatched by the Vulcan Foundry for the latter railway about the middle of June, and five complete trains for the same system are also on order and will, it is hoped, be delivered in August.

### Manchukuo Interest in Proposed Chinese Line

It is authoritatively stated in Peiping that the South Manchuria Railway is granting financial assistance to the Peiping-Mukden Railway for the construction of a new chord line from Tsangchow to Shihchiachwang. It is significant that the new line will be isolated from the rest of the system, Tsangchow being on the Tientsin-Pukow main line and Shihchiachwang on the Peiping-Hankow line and the junction with the Chengting-Taiyuan Railway. The length of the new line will be about 220 km. Mr. Chen Chueh-Sheng, Managing Director, P.-M.R., is also negotiating for a loan of $5 million from the Chinese banks in North China for this construction. The participation of the S.M.R. is, however, noteworthy both politically and financially, especially when the geographical position of the new line is considered.

### Opening of the Hwainan Railway

The formal ceremonial opening of the Hwainan Railway took place on June 5 on the completion of the last section of the line from Chaohsien to the north bank of the Yangtze opposite Wuhu. The total length of the railway is 215 km., and is said to have cost only $8,900,000, or $20,000 a km. June 5 was also the sixth anniversary of the opening of the Hwainan coal mines mainly to serve which the railway has been built.

### Shanghai-Hangchow-Ningpo Loan

On June 5 the Chinese Government 6 per cent. £. sterling Shanghai-Hangchow-Ningpo Railway Completion Loan was formally sanctioned by the Legislative Yuan, an important step in Chinese law, and one which enables the Government to issue the loan immediately. The bonds are to be floated by a syndicate composed of the British & Chinese and the China Development & Finance Corporations. The sum involved is £1,100,000.

## MANCHUKUO

### S.M.R. Purchasing Agent in Berlin

Following the conclusion of a German-Manchukuo commercial agreement on April 30, the South Manchuria Railway has decided to establish a representative in Berlin as a purchasing agent for German equipment.

June 16 was recently announced as the probable date for the official opening of the Pingchuan-Chengteh (Jehol) section of the new line connecting the capital of Jehol with the remainder of Manchukuo.

## CANADA

### Temiskaming Rolling Stock Orders

Col. MacLang, Chairman of the Temiskaming & Northern Ontario Railway, has announced that his railway had let a contract for the supply of nine air-conditioned coaching vehicles, valued at $400,000, to the National Steel Car Company, Hamilton. Five of the cars will be passenger coaches and four passenger-brake composites and the date of delivery is October 1. Two locomotives have also been ordered from the Canadian Locomotive Company, Kingston.

# Locomotive Performance on the Nord

## The work of the latest 2-8-2 tank and 2-10-0 freight types

In the issue of THE RAILWAY GAZETTE for March 17, 1933, details were given of a new type of 2-8-2 tank locomotive built for the Northern Railway of France, and of some exceptional performances which had been achieved by No. 4.1200, the first engine of the series, when on test. The trial runs proved these engines to be capable of maintaining 68 m.p.h. up 1 in 200 gradients with a trailing load of nearly 500 tons. Some interesting details are now to hand from Baron G. Vuillet of the day-to-day performance of this class on the Paris suburban services to which they are rostered. It will be recalled that the new 2-8-2 tanks have two cylinders 25¼ in. dia. × 27½ in. stroke with Cossart poppet valves, 5 ft. 1 in. driving wheels, 33·4 sq. ft. grate area, a working pressure of 261 lb. per sq. in., and a total weight in working order of 120 tons, of which 86½ tons is adhesion weight. The trains hauled on the Paris-Valmondois service, which from the grading point of view is the most difficult of the suburban lines, consist of five of the latest all-steel cars of high capacity, weighing loaded about 245 tons, and worked as push-and-pull units, with the engine at the leading end of the train when leaving Paris, and at the rear end when returning. The distance is 18·2 miles, and inclusive of fourteen intermediate stops the time allowed on the outward journey is 47 min.; on the return journey the schedule is increased temporarily to 51 min., in order to allow of reduced speed over the engineering works in progress between St. Denis and the Gare du Nord, as well as of one additional stop. Over the 12·6 miles between Epinay and Valmondois the ruling gradient is 1 in 67, complicated by reverse curves of 20 chains radius. Station times are 20 sec. each.

In the outward direction, with engine No. 4.1271 and a 245-ton train, the run of 7·0 miles from Paris to Enghien was made in 9 min. 42 sec. start-to-stop, inclusive of a permanent way slowing which cost a minute. Cut-off at starting was 70 per cent., reduced very shortly to 50 per cent., and after reaching 20 m.p.h. to 17 per cent.; 15 per cent. sufficed to maintain from 55 to 63 m.p.h. From the numerous stops, speed rose on level track to 60 km.p.h. (37½ m.p.h.) roughly 60 seconds after the regulator had been opened; up a gradient of 1 in 67 from the start 40 km.p.h. (25 m.p.h.) was reached in the same time. Cut-off was generally about 30 per cent., and the pressure in the steam chest averaged 185 lb. per sq. in., out of the full boiler pressure of 213 lb. With a cut-off of 20 per cent., the engine maintained a steady 37 to 39 m.p.h. up 1 in 67, which was amply sufficient to ensure timekeeping. The overall time from Paris to Valmondois was 46 min. 20 sec., and deducting the fourteen stops the actual running time for the 18·2 miles (including fifteen accelerations from rest and fifteen retardations) was 39 min. 10 sec.

Returning, with engine No. 4.1265 and the same load, the 14·4 miles from Valmondois to St. Denis, with fourteen intermediate stops, were run in 39 min. 40 sec., or an actual running time of 32 min. 36 sec.; the average distance between stops is only 0·96-mile. On the 1 in 67 ascent from Valmondois to Frépillon the engine ran the first 1·1 miles to Mèriel in 2 min. 40 sec. start-to-stop, attaining 37½ m.p.h.; the 1·5 miles from Mèriel to Méry occupied 3 min. 21 sec., start-to-stop, speed reaching 37½ m.p.h. in just under a mile from the start, and attaining a maximum of 39 m.p.h. (this was on 40 per cent. cut-off till 31 m.p.h. had been reached, and 30 per cent. after that); while the 0·9-mile from Méry to Frépillon was run in 2 min. 40 sec. Including 19 sec. standing at Mèriel and 20 sec. at Méry, the time for the 3·5 miles from Valmondois up to Frépillon was thus 9 min. 20 sec. The work from Mèriel to Méry demanded an indicated h.p. of roughly 2,000. On level sections, the distance of 0·9-mile from Champ de Courps to Enghien was covered in 1 min. 57 sec., start-to-stop, the first kilometre being run in 1 min. 18 sec., and the 1·8 miles from Enghien to Epinay in 3 min. 1 sec., speed reaching 53 m.p.h. in 1¾ min. from the dead start. This required 30 per cent. cut-off till 46 m.p.h. had been attained, and 25 per cent. after that, pressure in the steam-chest varying from 185 to 200 lb. When the engine is propelling the train, the cut-off is adjusted from the front driving compartment, but only partial openings of the regulator are made, the final adjustment of regulator opening being by the fireman on the footplate, in order to avoid slipping. The cut-off of the poppet-valves on these engines is capable of very fine adjustment. Slack was used throughout for firing, except on the Frépillon grade, where briquettes were substituted.

A further record by Baron Vuillet relates to the work of one of the large 2-10-0 freight locomotives of the 5.1200 series, illustrated and described in THE RAILWAY GAZETTE of December 29, 1933. These engines were designed for the working of 2,000-*tonne* coal trains between the Lens coalfield and Paris, over a route with a ruling gradient of 1 in 200. They have 19¼ in. × 26¾ in. h.p. and 25¼ × 27½ l.p. cylinders, all with piston rods, 5 ft. 1 in. coupled wheels, 2,108 sq. ft. of heating surface, 656 sq. ft. of superheating surface, 37·4 sq. ft. of firegrate, 261 lb. per sq. in. pressure, and a weight, in working order, without tender, of 102½ tons, of which 88½ tons are available for adhesion. The engine on this run was No. 5.1216, with a train of 74 loaded wagons weighing 1,915 tons. The allowance from Longueau over the 91·4 miles to La Chapelle by the Montdidier route (which keeps this traffic off the main passenger lines between Boves and Paris) is 4 hr. 42 min., including 12 min. in all standing at Estrées St. Denis and Canly. Getting away from Longueau the driver used 65 per cent. cut-off in the h.p. and 70 per cent. in the l.p. cylinders. The h.p. cut-off was gradually brought back to 45 per cent. (l.p. remaining unchanged), with which 17 to 19 m.p.h. was maintained up the 1 in 333 to Boves, pressure in the h.p. chest being 215 lb. and in the l.p. chest 35 lb. per sq. in. Boves, 3·9 miles from the start, was passed in 14 min. 23 sec. Between Boves and Gratibus the engine attained 37 m.p.h., and ran on the level at 34 m.p.h.; the average speed over this 14·1 miles was 28·4 m.p.h., and Gratibus, 18·0 miles, was passed in 44 min. 5 sec. Before starting the fire had been made up high at the back with briquettes, and along this length slack was being added, three to five shovelsful at a time. After Moreuil the engine was eased, and at Montdidier (21·2 miles, 55 min. 50 sec.) was checked by signal to 9 m.p.h. Up the ensuing 1 in 200 ascent, the engine was opened out to 64 per cent. cut-off in the h.p. and 66 per cent. in the l.p. cylinder, pressure rising to 242 lb. in the h.p. and 65 lb. in the l.p. steam chests, and the result, notwithstanding the curves, was to produce an acceleration, with this trailing load of 1,915 tons, from 13 to 17½ m.p.h., in no more than 2 km. (1¼ miles), and finally to 19 m.p.h., with an estimated i.h.p. output of 2,000. Km. 103, the summit of Tricot incline, was passed in 24 min. from Montdidier (6·3 miles), the h.p. cut-off having been gradually reduced to 52 per cent. A few large lumps were added from time to time to the fire with the slack, and the grate was shaken as required; descending at a maximum of 40 m.p.h., the train reached Estrées St. Denis, 36·8 miles from Longueau, in 101 min. 35 sec. The short run of 4·7 miles from there to Canly was made in 16 min. 25 sec. start-to-stop. During a stop of 7 min. here the fire was again made up high with briquettes. From Canly start, Longueil, 2·5 miles, was passed in 7 min. 35 sec., and Ormoy-Villers, 16·9 miles, in 54 min.; from here up the 1 in 200 towards Dammartin, with 60 per cent. h.p. and 68 per cent. l.p. cut-off, 228 lb. of steam in the h.p. and 56 lb. in the l.p. chests, speed was maintained at 15 m.p.h. Dammartin, 30·1 miles, was passed in 99 min. 45 sec., the engine having been eased to 8-10 m.p.h. up the remainder of the incline. Downhill speed reached 37 m.p.h., and Aulnay, 42·5 miles, was passed in 125 min. 40 sec. Signal checks were experienced from here onwards, culminating in three successive stops of 5 sec., 90 sec. and 60 sec., but the coal depot at La Chapelle was reached almost exactly to time.

# BRITISH RAILWAY STATISTICS

*"The Railway Gazette" monthly table for Mar., 1936, as compared with Mar., 1935, compiled from the Ministry of Transport Statement No. 196*

| Description | Great Britain* | G.W.R. | L.N.E.R. | L.M.S.R. | S.R. |
|---|---|---|---|---|---|
| PASSENGER TRAIN TRAFFIC— | | | | | |
| Number of pass. journeys (ex. season ticket holders) | 99,150,032 | 6,691,155 | 14,090,932 | 22,624,990 | 16,819,879 |
| Increase (+) or decrease (−) | + 3,793,382 | + 392 | + 635,283 | + 597,297 | + 457,931 |
| Passenger receipts (excluding season ticket holders) | £3,330,374 | £415,085 | £649,240 | £1,008,367 | £708,157 |
| Increase (+) or decrease (−) | + £142,539 | + £16,339 | + £30,429 | + £42,164 | + £24,632 |
| Season ticket receipts | £825,844 | £49,885 | £133,831 | £210,413 | £274,141 |
| Increase (+) or decrease (−) | + £46,701 | + £3,262 | + £2,308 | + £7,965 | + £21,116 |
| Parcels and misc. traffic receipts (excluding parcels post) | £1,071,583 | £202,422 | £323,780 | £404,377 | £122,331 |
| Increase (+) or decrease (−) | + £22,433 | + £7,976 | + £10,469 | + £7,487 | − £3,403 |
| FREIGHT TRAIN TRAFFIC— | | | | | |
| Freight traffic (tons) (excluding free-hauled) | 22,751,836 | 5,062,731 | 10,432,604 | 10,866,091 | 1,383,309 |
| Increase (+) or decrease (−) | + 732,274 | − 105,895 | + 431,860 | + 424,979 | − 6,395 |
| Net ton-miles (excluding free-hauled) | 1,339,603,983 | 240,444,795 | 448,523,170 | 556,990,008 | 55,919,016 |
| Increase (+) or decrease (−) | + 98,196,041 | + 12,153,190 | + 36,632,798 | + 48,015,451 | − 714,388 |
| Average length of haul (miles) (excluding free-hauled) | 58·88 | 47·49 | 42·99 | 51·26 | 40·42 |
| Increase (+) or decrease (−) | + 2·50 | + 3·32 | + 1·80 | + 2·51 | − 0·33 |
| Freight traffic receipts | £7,238,246 | £1,211,000 | £2,355,000 | £3,045,000 | £387,788 |
| Increase (+) or decrease (−) | + £323,154 | + £52,000 | + £111,500 | + £138,000 | + £5,359 |
| Receipts per ton-mile | 1·297d. | 1·21d. | 1·26d. | 1·31d. | 1·66d. |
| Increase (+) or decrease (−) | − 0·040d. | − 0·01d. | − 0·05d. | − 0·06d. | + 0·04d. |
| Freight train-loads : Average train-load (tons) | 131·97 | 135·01 | 138·21 | 130·80 | 105·91 |
| Increase (+) or decrease (−) | + 4·45 | + 1·68 | + 5·69 | + 5·60 | − 1·36 |
| Net ton-miles— | | | | | |
| Per train engine-hour | 980·13 | 1,051·38 | 1,054·94 | 928·72 | 803·25 |
| Increase (+) or decrease (−) | − 40·96 | − 47·64 | − 14·14 | − 55·00 | − 54·34 |
| Per shunting-hour | 894·83 | 818·70 | 995·71 | 921·81 | 558·93 |
| Per total engine-hour | 467·77 | 460·28 | 512·24 | 462·63 | 329·59 |
| Net ton-miles per route-mile per working day | 2,941 | 2,816 | 3,120 | 3,531 | 1,210 |
| Increase (+) or decrease (−) | + 222 | + 138 | + 246 | + 318 | + 18 |
| Wagon-miles. Total | 381,845,755 | 68,349,004 | 131,300,402 | 161,591,776 | 18,518,933 |
| Increase (+) or decrease (−) | + 24,002,653 | + 3,385,164 | + 7,799,988 | + 11,728,032 | + 1,111,248 |
| Percentage of loaded to total | 66·19 | 67·54 | 63·84 | 67·73 | 64·86 |
| Wagons per train. Total | 35·43 | 35·62 | 36·05 | 35·37 | 32·67 |
| Increase (+) or decrease (−) | + 0·80 | + 0·46 | + 0·72 | + 0·93 | + 1·37 |
| Loaded | 23·45 | 24·06 | 23·02 | 23·96 | 21·19 |
| Empty | 11·98 | 11·56 | 13·03 | 11·41 | 11·48 |
| Train-miles. Coaching—Per train-hour | 15·14 | 14·18 | 14·26 | 14·42 | 17·70 |
| Per engine-hour | 12·18 | 11·33 | 11·10 | 11·09 | 14·67 |
| Train-miles. Freight—Per train-hour | 8·73 | 9·47 | 8·97 | 8·23 | 9·47 |
| Per engine-hour | 3·54 | 3·43 | 3·74 | 3·53 | 3·07 |
| Engine miles. Total | 46,348,206 | 7,409,312 | 12,751,219 | 17,197,491 | 6,073,541 |
| Increase (+) or decrease (−) | + 1,468,975 | + 293,756 | + 389,717 | + 611,608 | + 176,114 |
| Mileage run by engines. Total train-miles— | | | | | |
| Coaching | 22,387,800 | 3,131,288 | 5,083,328 | 7,095,595 | 4,391,608 |
| Freight | 10,776,313 | 1,918,950 | 3,641,916 | 4,568,907 | 566,839 |
| Engine-hours in traffic. Total | 5,090,391 | 862,093 | 1,504,742 | 2,020,667 | 504,384 |
| Increase (+) or decrease (−) | + 280,372 | + 40,583 | + 74,387 | + 148,065 | + 17,149 |
| Shunting miles per 100 train-miles— | | | | | |
| Coaching | 7·43 | 6·84 | 6·54 | 8·08 | 8·48 |
| Freight | 73·58 | 82·19 | 68·31 | 70·14 | 99·72 |

***Passenger Traffic Statistics: Number of journeys, receipts, and receipts per journey (excluding season ticket holders)—March, 1936***

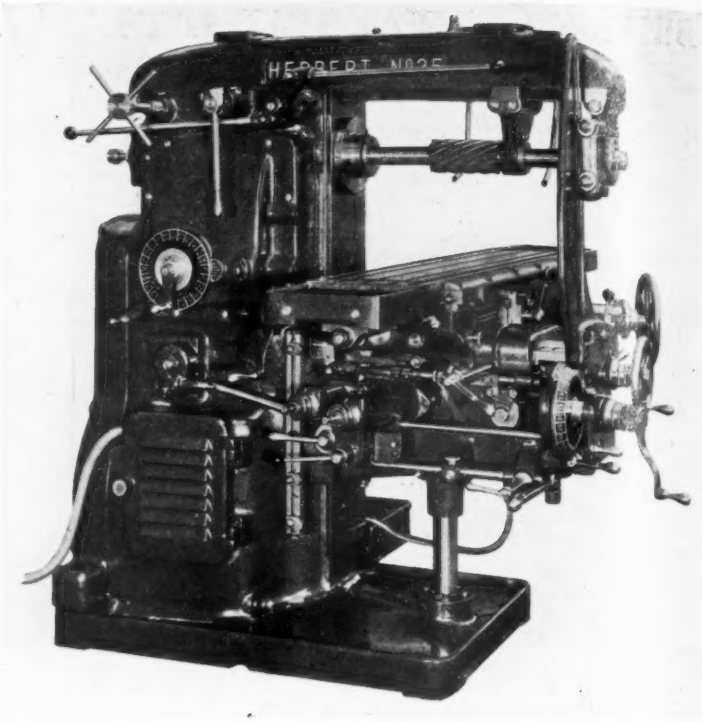
| Subject | Great Britain | G.W.R. | L.N.E.R. | L.M.S.R. | S.R. | Cheshire Lines | Liverpool Overhead | L.P.T.B.† | Mersey |
|---|---|---|---|---|---|---|---|---|---|
| Full fares— | | | | | | | | | |
| Pass. journeys | 31,824,927 | 631,078 | 1,135,595 | 1,399,894 | 2,571,399 | 14,460 | 147,222 | 25,080,760 | 72,614 |
| Gross receipts | £796,715 | £66,673 | £106,495 | £109,628 | £159,494 | £2,328 | £1,489 | £335,484 | £1,269 |
| Receipts per pass. | 6·01d. | 25·36d. | 22·51d. | 18·79d. | 14·89d. | 38·64d. | 2·43d. | 3·21d. | 4·19d. |
| Reduced fares— | | | | | | | | | |
| Excursion and week-end— | | | | | | | | | |
| Pass. journeys | 36,233,127 | 3,793,672 | 8,421,948 | 12,827,139 | 7,732,588 | 378,452 | 78,244 | 1,346,888 | 649,640 |
| Gross receipts | £1,830,079 | £276,961 | £409,686 | £665,409 | £392,617 | £18,893 | £695 | £28,641 | £9,582 |
| Receipts per pass. journey | 12·12d. | 17·52d. | 11·67d. | 12·45d. | 12·19d. | 11·98d. | 2·13d. | 5·10d. | 3·54d. |
| Workmen— | | | | | | | | | |
| Pass. journeys | 27,557,508 | 1,872,018 | 3,640,200 | 7,382,012 | 5,830,228 | 251,634 | 204,656 | 7,217,694 | 206,458 |
| Gross receipts | £402,602 | £27,870 | £59,525 | £118,703 | £96,602 | £4,298 | £1,665 | £80,605 | £1,865 |
| Receipts per pass. journey | 3·51d. | 3·57d. | 3·92d. | 3·86d. | 3·98d. | 4·10d. | 1·95d. | 2·68d. | 2·17d. |
| Other— | | | | | | | | | |
| Pass. journeys | 3,528,100 | 393,071 | 891,713 | 1,013,257 | 684,840 | 62,315 | 42,314 | 369,191 | 9,862 |
| Gross receipts | £292,520 | £42,065 | £71,510 | £110,545 | £58,685 | £3,962 | £266 | £3,159 | £172 |
| Receipts per pass. journey | 19·90d. | 25·68d. | 19·25d. | 26·18d. | 20·57d. | 15·26d. | 1·51d. | 2·05d. | 4·19d. |
| Total— | | | | | | | | | |
| Pass. journeys | 99,150,032 | 6,691,155 | 14,090,932 | 22,624,990 | 16,819,879 | 706,905 | 472,436 | 34,014,533 | 938,574 |
| Gross receipts | £3,330,374 | £415,085 | £649,240 | £1,008,367 | £708,157 | £29,524 | £4,115 | £447,889 | £12,888 |
| Receipts per pass. | 8·06d. | 14·89d. | 11·06d. | 10·70d. | 10·10d. | 10·02d. | 2·09d. | 3·16d. | 3·30d. |

* All standard gauge railways † Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

## A NEW HERBERT PLAIN MILLING MACHINE

ALFRED HERBERT LIMITED, Coventry, has recently introduced a new and entirely self-contained horizontal milling machine capable of high output with sustained accuracy, and freedom from breakdown, under the most exacting conditions of modern practice. It has the necessary power to do the heaviest milling duties within its capacity, enabling full advantage to be taken of the high-speed cutting alloys now available. The driving box, which is built as a separate unit, provides 24 spindle speeds, from 25 to 1,290 r.p.m., and is housed inside the column, speed changes being made through cam-operated gears sliding on multi-splined shafts. The machine is controlled by a starting lever on the left-hand side of the column.

Feed changes are made through sliding gears cam-operated by a hand crank at the front of the knee. Quick-power traverse to the table is driven by a small constant-speed motor carried on the right-hand side of the knee. This motor is connected to the feed shaft through a multi-disc clutch operated by a lever at the front of the knee. The feed and quick-power traverse are interlocked.




*New dual-control motor-driven plain milling machine*

## CORROSION OF PAINTED STRUCTURES

A REVIEW of the experimental work being done by the Joint Corrosion Committee of the Iron and Steel Institute and the British Iron and Steel Federation has been compiled by Dr. W. H. Hatfield, F.R.S. and published by the Iron and Steel Institute.

Steels in which the railway engineer is particularly interested are being tested in the field at stations that include inland, marine, arctic, temperate, sub-tropical and tropical conditions. An elaborate combination of various priming coats with some sixteen different finishing coats is being studied. The metallurgical history of every steel used has been recorded. Thus, probably for the first time in corrosion research, the details of manufacture are being correlated with performance in field tests. Although insufficient time has elapsed to achieve conclusive comparison, certain interesting tentative conclusions have been drawn from both field and laboratory tests.

There are indications that painted specimens which were partially de-scaled by weathering before painting have proved inferior. The tests point also to the importance of using an inhibitive paint, such as red lead, for the priming coat on structural steelwork. Readers who are conversant with Dr. Ulick Evans' work at Cambridge on oxide films and the "passivity" of metallic surfaces will understand the application of the term "inhibitive" to paints, such as red lead, which protect the metal against corrosion not only by excluding the corrosion agents but also by rendering the metal surfaces electrolytically passive.

Corrosion tests on steel sleepers under service conditions suggest that copper bearing steels will last longer than ordinary mild steels. Such steels usually contain from 0·25 to 0·30 per cent. of copper.

The committee has carried out some instructive researches, complementary to the field tests, upon factors arising from the already well-known importance of painting procedure in resisting corrosion. We quote from its findings:—

For atmospheric corrosion it may be generally accepted that the best all-round practical method of painting steel structures . . . . consists in giving them an adequate priming coat (or coats) of good red lead paint followed by suitable finishing paints, primarily chosen for their resistance to weathering and their impermeability to moisture. Some latitude is permissible in the choice of the paint for the finishing coat, and there is not a great deal to choose between such paints as red oxide, micaceous iron ore, and zinc oxide. For general purposes a good red oxide paint is as satisfactory as any. The surface condition of the metal prior to painting is of greater importance than the paints used . . . . An imperfectly weathered surface, *i.e.*:—a surface from which the scale has only partially been removed, is undoubtedly the worst for the application of paint. Accelerated rusting of the bare particles may occur through electrolytic action between the metal and the scale, while rusting may also occur beneath the latter, lifting this and the superimposed paint film completely off the specimen. Painting over a perfectly intact rolling scale might give very good results, but from a commercial point of view it does not seem a practical proposition to hope to prevent steel from rusting during the interval between rolling and erection on the site. An alternative consists in oiling or painting steel while it is still hot at the rolling mill; this process has been found to give good results, but here again it is hardly a commercial proposition . . . . There remain the processes by which the rolling scale is completely removed from the steel surface prior to painting. Of these, complete removal by natural agencies *i.e.*: by weathering, is most common . . . . the fact that all steel products have a definite shape tends to prevent complete descaling of all parts of a structural member *e.g.*, the under parts of an angle may not be completely descaled after a considerable period of exposure. Nevertheless, a thoroughly weathered surface will probably give good results if sufficient care is given to the cleaning down and to the quality of the paints applied.

In the independent series of tests on protective coatings organised from Cambridge University, special attention was devoted to specimens on which the coating had been intentionally made faulty. Thus, before exposure to corrosion, scratches had been ruled through the coat, or the coat had been cracked by bending the supports, or a strip had been left uncoated. It is by the behaviour at such places that the difference between good and bad protective methods has been judged, and not by the behaviour at places where the coating reached a standard that might rarely be attained in service.

Some protective coats have been found to prevent rusting even at a break in the coat, while others permit intensified corrosion to occur at such places. In paint tests on steel, exceptionally intense corrosion has been produced if a scratch line is pierced through the mill scale just before painting, and this intense attack causes both scale and paint to rise and flake off. Dr. Ulick Evans has suggested to the committee that the study of faultily applied coats, or of coats damaged after application (*i.e.* by mechanical removal, or by the action of broken scale such as is found in almost all steel sections after handling) has more practical value than the study of perfect coats. This view will be endorsed by informed opinion, as will another finding of the committee, which states that, in order to take full note of service conditions, it is arranging a series of tests of actual structures for the observation of the effect of elastic deformation (due to stress) upon the behaviour of the paint coating.

The results of tests reported to the committee by H.M. Admiralty suggest that there is little danger of corrosion arising from welds, given correct welding procedure.

## REINFORCING RAIL-TO-SLEEPER FASTENINGS

AN ingenious patented method of providing a tight fastening for coachscrews holding rails or chairs to wooden sleepers is the Metospir, illustrated herewith, and which we understand is being used on an extensive scale on many Continental railways, and is also being tried on certain British railways. Reports of its satisfactory behaviour are unanimous. Fig. 1 shows *A* a coachscrew, *B* a Metospir mandril, *C* and *D* a Metospir, and *E* a shaping nut.

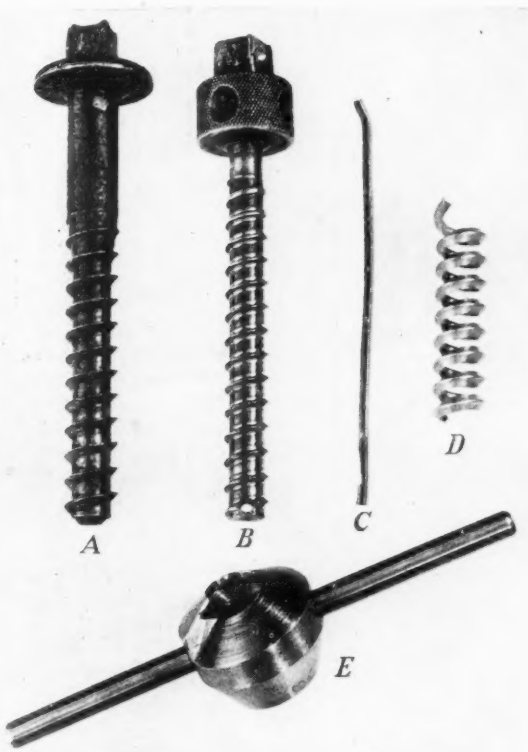



*Fig. 1—Metospir strips and tools*

The Metospir consists of a flexible metal strip *C* of special V section. The forming of the spiral *D* is generally done on the site by wrapping the strip round the mandril *B*. The slotted end of the Metospir *C* is inserted in the hole at the bottom of the mandril *B* and bent over by hand, carefully following the mandril's thread for one pitch length, Fig. 2. The whole length is then wound and completed by the aid of the shaping nut *E*. The mandril, together with the Metospir, is then screwed into the sleeper in the same way as a coachscrew, but driving it only lightly on to the chair. By turning the mandril anti-clockwise, the notched end, fastening the Metospir *D* to the mandril *B*, breaks away and the mandril can be screwed out, leaving the Metospir firmly and accurately placed in the sleeper. Thus the old thread is filled up, and a new durable lining is provided ready to receive the thread of the coachscrew.

The thread on the mandril is pitched to correspond with that of the coachscrew and its diameter is everywhere smaller than the corresponding dimensions of the coachscrew. This smaller diameter and pitch of the Metospir mandril not only permits the Metospir to be passed through the hole in the chair, but also results in heavy friction between the coachscrew and Metospir, thus ensuring a tight connection between the screw, the Metospir, and the sleeper which is directly responsible for the great holding power and security of this fastening.

The Metospir method is successfully applied to maintain straight lengths when coachscrews tend to become loose, as well as in curves when they begin to show a tendency to spread. This ingenious device provides a means of tightening up and increasing the holding power of coachscrews in worn sleepers, thus preventing further wear, while material and maintenance costs are saved and safety is increased.

*Fig. 2—Method of fixing strip to mandril*

# MICHELIN DEVELOPMENTS

## *The French State Railways introduce two high-capacity types*

TWO Michelin pneumatic-tyred vehicles have just been acquired by the French State Railways and they form a culmination of four years of steady and progressive development. The new sets of the Etat are of two types, the first a triple-bogie single-frame design with a 400 b.h.p. engine and 96 seats, and the second a triple-car train with two 250 b.h.p. engines and 106 seats.

### 400-B.H.P. Car

This vehicle is remarkable for the great length of the body, viz., 99 ft. 4 in. The body and underframe are in one structure, designed as a double Warren girder and supported at three points. The carrying bogie centres are spaced 70 ft. 10 in. apart, and the driving bogie is in the centre and carries the engine, transmission, and most of the auxiliary equipment; it is connected to the body framing through two long thrust beams which are anchored on the driving bogie headstocks and to the body framing near the carrying bogies, but part of the body weight is supported directly by this bogie through sprung rollers.

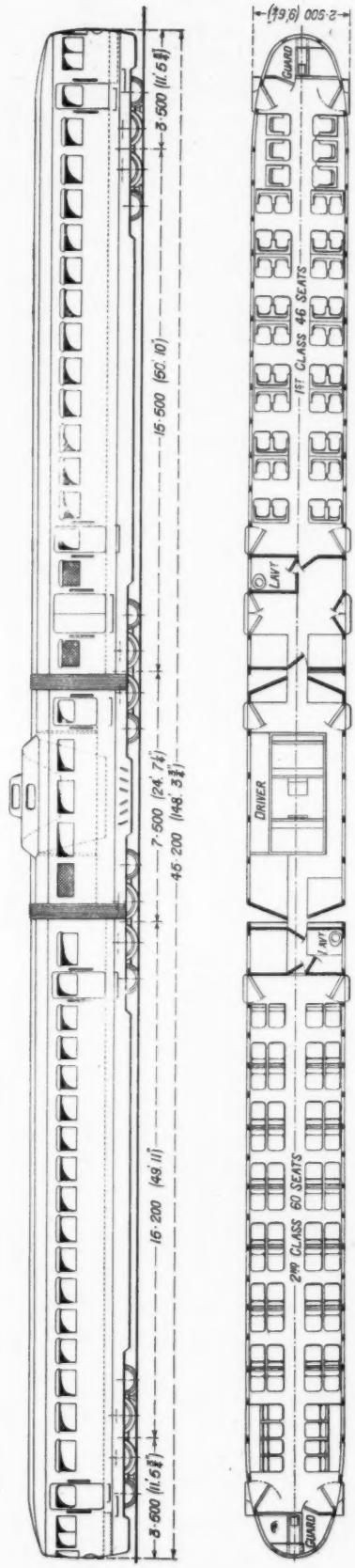
The body framing is made up of square tubing with radiused corners, the material used being manganese steel with an ultimate strength of 40-42 tons per sq. in. and an elastic limit of 30-31 tons per sq. in. The panelling is of 19 s.w.g. duralumin sheets stiffened with duralumin U sections spot welded to the inner sides. This duralumin structure takes no great part in the support of the load; actually, before this panelling was put on, the girder frame was tested with a load of 35 tons without any permanent deflection. Owing to the great length between the carrying bogie centres the throw-over of the body on curves is large, amounting to 21½ in. on a 5-chain radius.

The eight-wheeled carrying bogies and the method of supporting the body on them differs somewhat from the practice established for the ordinary Michelin 56-seater cars. The body is carried by inclined thrust rods fitted with ball and socket joints attached to the bogie frame through quarter elliptical springs. The bogie centre does not carry superimposed load, but of course passes the braking force; it allows the body to move laterally in relation to the bogie within the limits imposed by the thrust rods.

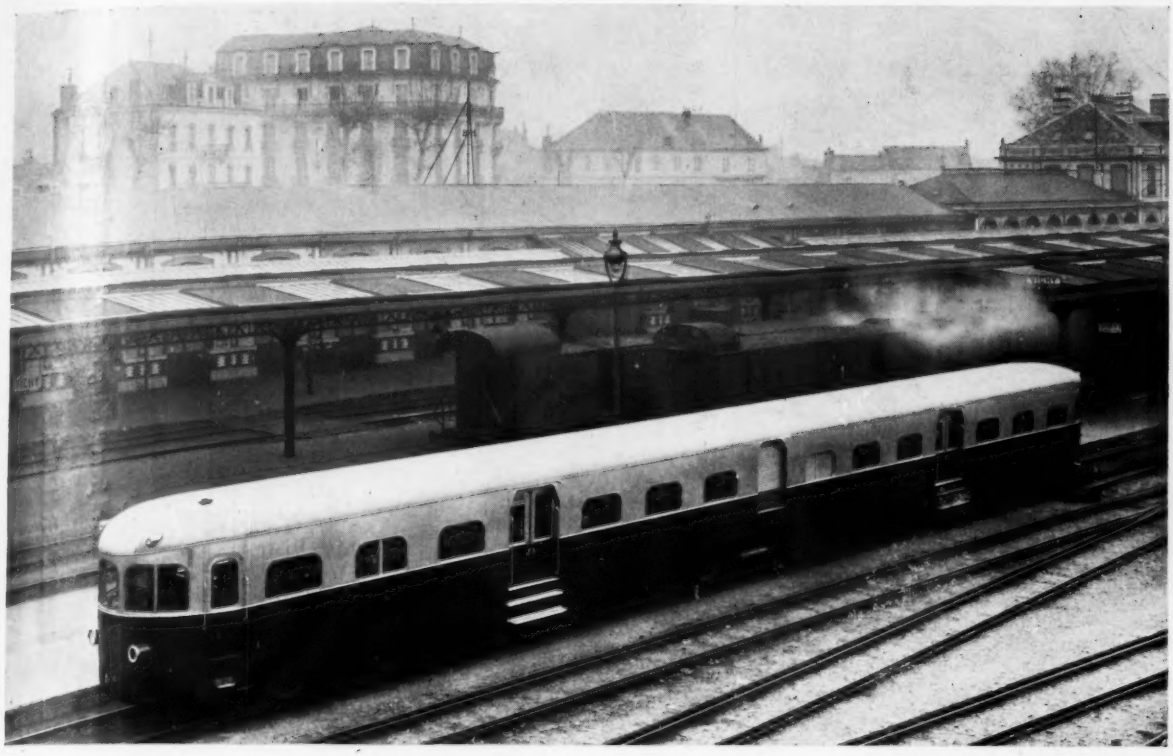
In view of the relatively great power of the engine it was necessary to drive all four axles of the power bogie. The 400 b.h.p. 12-cylinder Panhard vee petrol engine, running at 1,600 r.p.m., has a double-end drive, with a Vulcan-Sinclair hydraulic coupling and a Cotal electro-magnetic epicyclic gearbox at each end, a combination which makes remote control an easy matter. The drive is taken directly from each gearbox to the adjacent axle and transferred to the outer axles through chains. The engine unit is carried on the bogie frame by four conical rubber blocks, and further rubber blocks are inserted under the springs carrying the roller supports for the body. This new Michelin car tares only 16 tons and has a top speed of 140 km.p.h. (87 m.p.h.). It can cruise at about 70 m.p.h. without exceeding the continuous capacity of the engine.

### 500-B.H.P. Trains

These triple-unit trains have a carrying capacity only slightly exceeding that of the 400 b.h.p. car, 106 com-

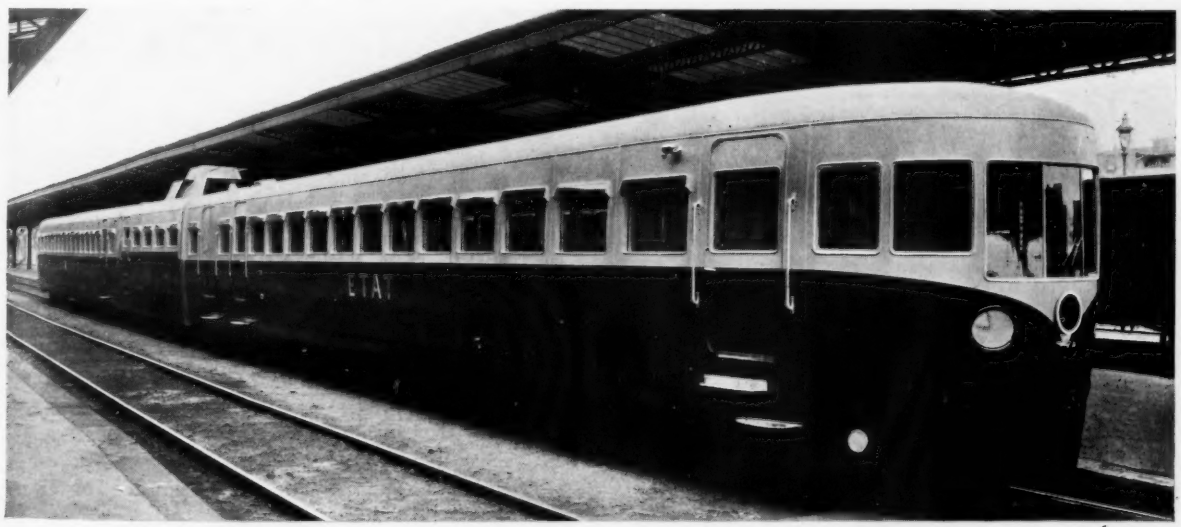



*These triple-car Michelin-pneumatic-tyred trains are part of a programme of express railcar-trains of great carrying capacity which is being carried through by the French State Railways. The centre vehicle contains two 250 b.h.p. Hispano-Suiza petrol-engines with Vulcan-Sinclair hydraulic couplings and Cotal electro-magnetic gearboxes. The maximum permissible speed in normal service is 87 m.p.h. With a full complement of passengers the weight is approximately 31 tons, giving a ratio of 16 b.h.p. per ton of gross weight and 4·7 b.h.p. per seat*



*400 b.h.p. single-unit Michelin-pneumatic-tyred railcar for express and semi-fast services at Vichy station, P.L.M.*

pared with 96, but the extra power will be utilised in maintaining high speeds and giving high rates of acceleration on fast services, whereas the 400 b.h.p. car will operate more on *semi-direct* trains. The motive power of the three-car train consists of two 250 b.h.p. Hispano-Suiza 12-cylinder vee petrol engines, each with its own Vulcan-Sinclair fluid coupling and Cotal electro-magnetic gearbox. The train is supported on two carrying and two driving bogies, the latter pair being the articulation units. All are of the eight-wheeled type, and all axles of the articulation bogies are driven. The normal maximum speed is 87 m.p.h. The principal dimensions and the layout of this train are shown on an accompanying diagram. Steel flanges are fitted only to the two outer pairs of wheels of each bogie, the inner pairs simply having the pneumatic treads without any guiding device. A similar arrangement is applied to the 400 b.h.p. car but only so far as the carrying bogies are concerned.




*One of the new triple-car Michelin-pneumatic-tyred trains for fast long-distance services on the French State Railways. The train tares only 21 tons*

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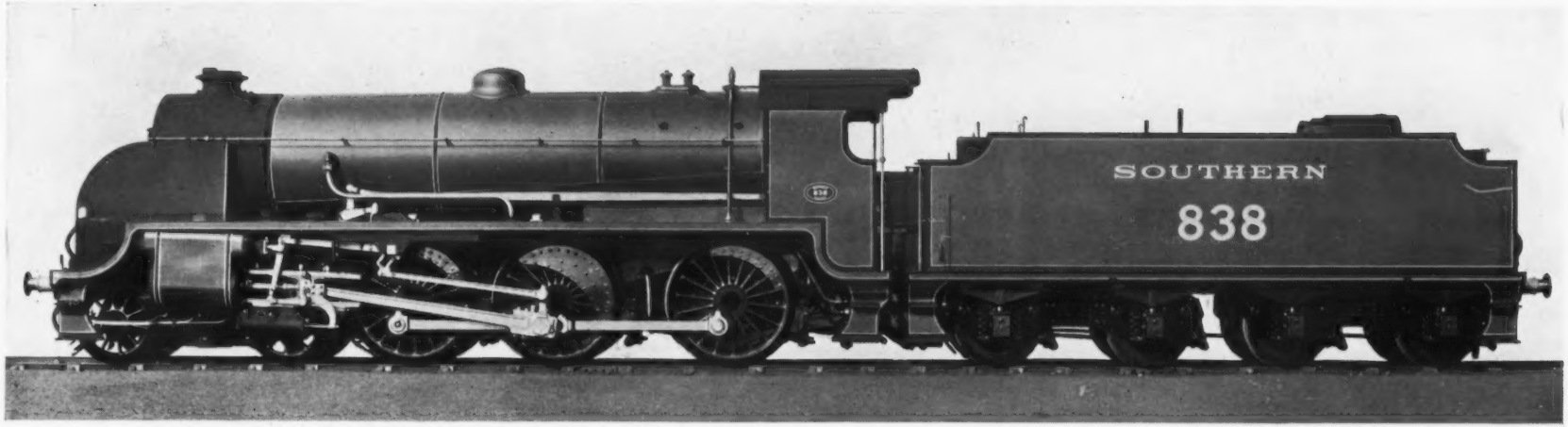
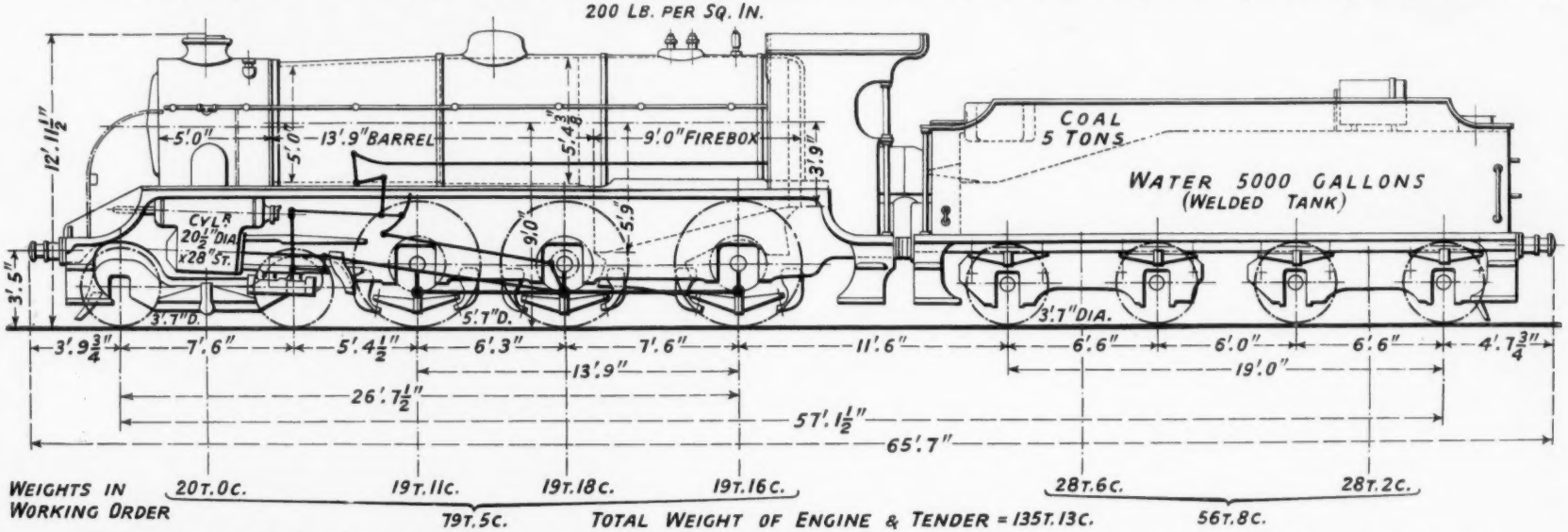



*General view of the first of a new series of ten "S.15" class express freight locomotives with new eight-wheel tender as fitted to the first five engines of the series*




*Outline diagram of the above locomotive. The five later engines of the series will have six-wheel tenders released from "King Arthur" class locomotives, for service on the Central Section*

*NEW 4-6-0 EXPRESS FREIGHT LOCOMOTIVES, SOUTHERN RAILWAY*

*(See article on opposite page)*

# NEW EXPRESS FREIGHT LOCOMOTIVES, SOUTHERN RAILWAY

## *A further series of "S.15" class 4-6-0 type engines with slight modifications*

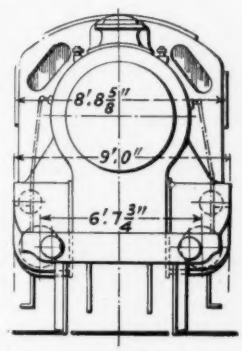
(*See illustrations on opposite page*)

THE first of another ten engines of the "S.15" 4-6-0 type locomotives, used for fast freight and mixed traffic purposes, has been completed at the Southern Railway workshops at Eastleigh. This new series differs only in minor details from the last fifteen engines of the class. The forerunners of the class comprised twenty engines (Nos. 496 to 515) designed by Mr. Urie for the London & South Western Railway in 1920. After the formation of the Southern Group, a further fifteen engines (Nos. 823 to 837) were constructed at Eastleigh, in 1927, to the design of Mr. R. E. L. Maunsell, the Chief Mechanical Engineer, and these embodied a number of features introduced in the "King Arthur" class, such as long-travel piston valves, and were, in fact, reproductions of the express passenger engines with 5 ft. 7 in. instead of 6 ft. 7 in. diameter coupled wheels.

The first five engines will have bogie tenders of the straight-sided type, with electrically-welded tanks and disc wheel centres. These carry 5,000 gall. of water and 5 tons of coal, and the total wheelbase of engine and tender is 57 ft. 1½ in., while the total length over buffers is 65 ft. 6¾ in. For working over the Central Section of the railway, the last five engines are to have 4,000-gall. six-wheeled tenders at present running behind certain engines of the "King Arthur" class, which will receive new bogie tenders in exchange. The length over buffers will then be reduced to 61 ft. 3 in. and the total wheelbase to 51 ft. 3¾ in.

The particulars of the ten engines now being completed are as follow:—

| | |
|---|---|
| Cylinders (2) | 20½ in. dia. 28-in. stroke. |
| Driving wheels | 5 ft. 7 in. dia. |
| Boiler pressure | 200 lb. per sq. in. |
| Tractive effort | 29,860 lb. (at 85 per cent. B.P.) |
| Heating surface— | |
| Small tubes | 1,252 sq. ft. |
| Large tubes | 464 ,, |
| Firebox | 162 ,, |
| Total | 1,878 ,, |
| Superheater (1⅜ in. dia. elements) | 337 ,, |
| Grate area | 28 ,, |
| Coupled wheelbase | 13 ft. 9 in. |
| Total wheelbase | 26 ft. 7½ in. |




*Front end view*

## The C.P.R. Transcontinental Jubilee

*One of the decorated C.P.R. locomotives used to haul the transcontinental jubilee train. The decorative adoption on the front of Canada's coat of arms was on a black background, unicorn in silver, lion in gold, scroll work in blue, grey, and crimson, and flags and coat of arms in standard colours. The wording "From Sea to Sea," and figures "1886–1936" on top were yellow, with the writing on black and the figures on blue ocean and green continent. The bunting was red and white, and shields on both sides of the locomotive carried the names of the Canadian provinces.* (*See news paragraph on page* 70)

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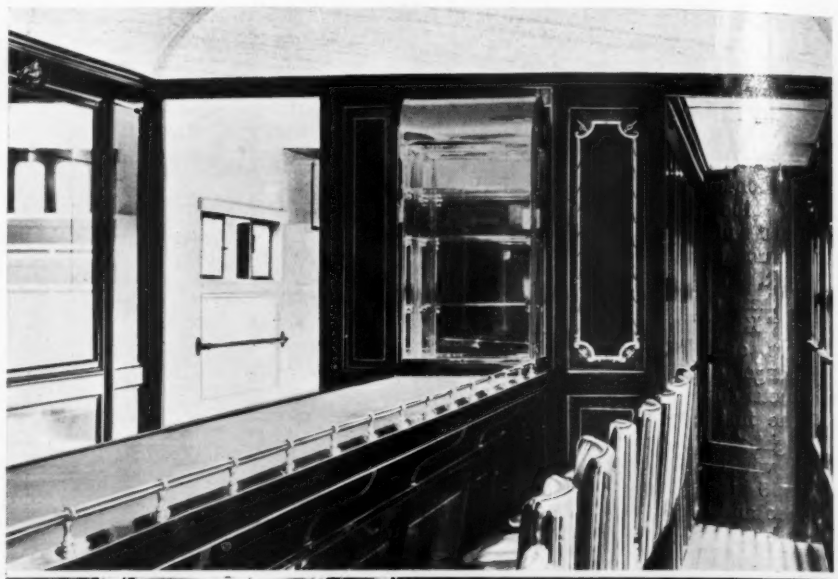
# PULLMAN BUFFET CAR FOR NEWHAVEN BOAT TRAINS

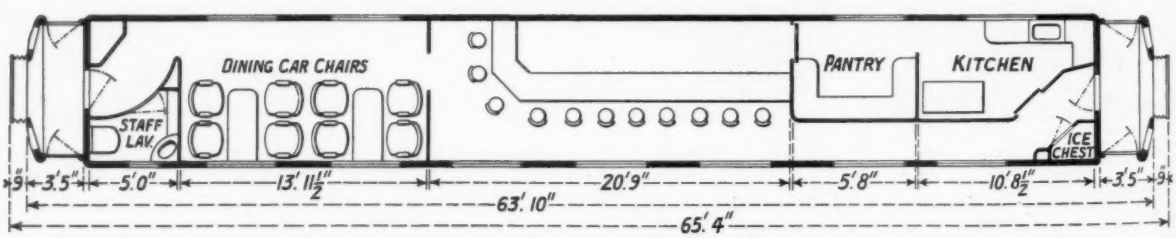
*The "Myrtle," the first of its class to work on the Southern Railway, entered service on Sunday last*

As we briefly recorded last week, the Pullman Car Co. Ltd. has recently completed a buffet car for service on the Southern Railway Company's Newhaven boat trains, and it was placed in service on Sunday last, July 5. This vehicle, which is a conversion of the Pullman car *Myrtle*, is the first of its class to operate on the Southern Railway, and a second vehicle is in course of preparation. The car, which has an overall length of 65 ft. 4 in., is arranged to provide a small saloon seating eight passengers at tables, and a large buffet compartment, 21 ft. long, with pedestal seats for eleven persons; there is also a large pantry and kitchen, and accommodation for staff, as may be seen from the drawing below. In its original form the *Myrtle*, which was built in 1911, was a Brighton first class Pullman car, and as such was familiar to regular Southern Belle travellers.

Furnishing and equipment are tasteful. The interior walls are panelled in Honduras mahogany relieved with marquetry; the bar counter is finished with rustless steel rails and mouldings and an illuminated show-case is fitted at one end. All other fittings in the buffet compartment are Chromium plated, and, at the back of the counter, are three rose tinted mirrors which are a special feature. A convenient hat rack is provided in the arrangement of the counter and adequate space is allowed for free movement. The lighting arrangement consists of two attractive modern type lanterns fitted in the ceiling of the buffet saloon; elsewhere the ordinary type of ceiling fitting has been adopted.



*Above:* *One end of the buffet counter*
*Below:* *Portion with dining car chairs (in foreground) and buffet beyond*




*Arrangement of the Pullman buffet car "Myrtle" now in service on the Newhaven boat train*

# RAILWAY NEWS SECTION

## PERSONAL

Mr. L. S. Blaisdell, General Manager, Southern Railways of Peru, has returned to headquarters at Arequipa, after several months' leave in Europe and the U.S.A.

Sir Hilary Leng, late Local Director of the Buenos Ayres Western Railway, whose death we announced in our issue of June 5, left estate valued at about £880,000.

Mr. A. H. Law, M.A., M.Inst.C.E., M.I.E.E., is relinquishing his position as Chief Engineer of the English Electric Company in September, but remains in the service of the company as Consulting Engineer, while being free to accept such other advisory work as does not conflict with his obligations to the English Electric Company. Mr. Law was General Manager of the Willans works of the company at Rugby from 1926 to 1930, when he became Chief Engineer.

Mr. A. D. Sloan, M.I.E.E., who is the Chief A.C. Designer of the English Electric Company, will succeed Mr. Law as Chief Engineer.

Mr. W. A. Kingsland, Vice-President and General Manager, Central Region, Canadian National Railways, has relinquished the title of General Manager but retains that of Vice-President of the region, with headquarters at Toronto. Mr. F. L. C. Bond, General Superintendent, Montreal, has been appointed General Manager, Central Region. Mr. Bond has wide construction experience and was appointed Chief Engineer, Central Region, in 1921, and General Superintendent Montreal, in 1924. Mr. T. C. Hudson, General Superintendent, Southern Ontario, succeeds Mr. Bond at Montreal, and Mr. J. F. Pringle, General Superintendent of Transportation, succeeds Mr. Hudson in Ontario.

Mr. Graves W. Eves has been elected a Director of the Barsi Light Railway Co. Ltd., to fill the vacancy caused by the death of Mr. F. Schooling.

Mr. Frederick Schooling, a Director of the Bengal-Nagpur and Barsi Light Railways, whose death we recorded in our issue of May 15, left estate valued at £214,384 (£205,966 net).

Mr. George L. Boag, who, as announced in THE RAILWAY GAZETTE of June 19, has retired from the position of General Manager, Great Southern of Spain Railway, began his railway career on the Lancashire & Yorkshire Railway, at Manchester, in 1887, and served with that railway for some 10 years in various departments and stations. In 1898 he left England to join the staff of the Argentine Transandine Railway, returning home when, in 1903, the working of that railway was undertaken by the Argentine Great Western. From 1904 to 1907 he was with the Southern Nigerian Railways in West Africa, leaving there to take up the appointment of Assistant Manager of the Great Southern of Spain. It was in June, 1913, that Mr. Boag was promoted to be General Manager, the position from which he now retires. He is the author of several books upon railways, including "Manual of Railway Statistics," published in 1912, and "The Railways of Spain," published in 1923. In addition he has been a frequent contributor to THE RAILWAY GAZETTE and acted as our correspondent in Spain for many years.

*Mr. George L. Boag,*
General Manager, Great Southern of Spain Railway, 1913–36

At the conclusion of his speech at the annual meeting of the Great Southern of Spain Railway Company last month, Mr. C. H. Pearson, the Chairman, said:

> "Mr. George L. Boag, after 29 years in the service of the company, during 23 of which he occupied the position of General Manager and devoted himself wholeheartedly to the interests of the company, has felt it incumbent upon him, after the culminating strain of recent events, to seek relief from the anxieties which unfortunately, have now for so long of necessity been associated with the position. With much regret your board has felt bound, in these circumstances, to accept his resignation, which took effect on the first of this month."

Mr. John R. Gillman, late General Manager of the Carthagena & Herrerias Steam Tramways Co. Ltd., has been appointed to succeed Mr. Boag as General Manager, Great Southern of Spain Railway, as from June 1 last. Mr. Gillman has great knowledge of railways in Spain, and is very familiar with local conditions.

Brigadier-General Sir H. Oswald Mance, K.B.E., C.B., C.M.G., D.S.O., is leaving for East Africa on July 24, to inquire into problems of co-ordination of various forms of transport in Kenya, Uganda & Tanganyika, on behalf of the two former Governments and the latter territory.

Mr. E. W. Head, who, as announced in THE RAILWAY GAZETTE of May 22, has retired from the position of General Manager, Ceylon Government Railway, received his early engineering training under Alley & MacLellan, Sentinel Works, Glasgow, and gained further experience on the Great Northern, the Midland, and the North Eastern Railways, Great Britain. He entered the service of the Ceylon Government Railway in 1902, was appointed District Locomotive Superintendent in 1905, Assistant Locomotive, Carriage and Wagon Superintendent in 1912, and Locomotive, Carriage and Wagon Superintendent in 1915, in succession to Mr. H. G. Unsworth. He held this post until the reorganisation of the Railway Depart-

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ment in 1924, when the Traffic and Locomotive Departments were amalgamated and when he was appointed Deputy General Manager (Operating and Mechanical). On the retirement of Mr. T. E. Dutton, C.B.E., from the service in August, 1932, he succeeded him as General Manager. Mr. Head was elected President of the Engineering Association of Ceylon in 1932, and has acted on several occasions as Chairman of the Railway Advisory Board. As recorded in our issue of June 26, Mr. Head is included in the King's Birthday Honours List as receiving the O.B.E.

*Mr. E. W. Head, O.B.E.,*
General Manager, Ceylon Government Railway, 1932–36

*Major E. W. Slaughter, M.B.E.,*
Appointed Agent, H.E.H. the Nizam's State Railway (India)

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Major E. W. Slaughter, M.B.E., M.I.Mech.E., who, as announced in our issue of May 1, has been appointed Agent of H.E.H. the Nizam's State Railway, served in the war as an Engineer officer, and thereafter took up an appointment with the Egyptian Government under the Public Works Ministry. In 1927 he was transferred to the Egyptian State Railways as Assistant Chief Mechanical Engineer, and was promoted to be Deputy Chief Mechanical Engineer in 1933. During his E.S.R. service he was responsible for the construction of the new locomotive workshops at Abu Zalal, Cairo, the organising of the Egyptian Railway Museum, and the inauguration of the road and water services of the State Railways. Major Slaughter also represented the railways on numerous transport development and co-ordination boards, and, in 1931 and 1933, was sent on special missions to railways in Belgium, Germany, Poland and England. He was appointed Deputy Locomotive Superintendent of the Nizam's Railway in January, 1935, and has since officiated as both Locomotive and Carriage Superintendent and Chief Transportation Superintendent, prior to his appointment as Agent on April 1 last. Major Slaughter was three times decorated by H.M. King Fuad of Egypt with the Orders of the Nile and Commander of the Order of Ismail.

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Mr. Henry Chappell, of Bath, known as the railway poet, and famous for his wartime poem "The Day," has resigned from his position as a porter on the Great Western Railway on grounds of health. He is 63 years of age and had 45 years' service with that railway.

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Mr. P. Petri, Maintenance of Way Engineer, Eastern Lines, Baltimore & Ohio Railroad, has been appointed to succeed the late Mr. Earl Stimson as Chief Engineer, Maintenance, of the whole system. Mr. Petri joined the Construction Department of the B. & O.RR. in 1899, and became Assistant Division Engineer, Chicago, in 1906, and Division Engineer, Newark, in the following year. He subsequently held charge of the Shenandoah, Ohio River, Connellsville and Cumberland Divisions until promoted to be District Engineer Maintenance, Pittsburg, in 1915. In 1918-19 Mr. Petri was Special Engineer, office of Assistant to Federal Manager, Baltimore, and then became Division Engineer of the two original divisions then combined as the enlarged Cumberland Division. It was in 1926 that he was promoted to be Maintenance of Way Engineer, Eastern Lines, with headquarters at Baltimore, the position he now vacates.

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We regret to record the death, on July 1, of Lt.-Col. Lewis William George Butler, a Director of the Weymouth & Portland Railway.

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Mr. Edward Simms, M.Inst.T., Secretary of the Commonwealth Railways of Australia, is at present in England on an extended holiday and leaves to return to Melbourne about the end of October.

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Mr. F. C. W. Christison has been appointed Secretary, Railways Commissioner, South Australian Railways, in succession to Mr. C. J. Boykett, who has retired.

***Major L. F. S. Dawes, M.B.E., late R.E.,***
Appointed Secretary to the Southern Railway Company

Major L. F. S. Dawes, M.B.E., who, as announced in THE RAILWAY GAZETTE of June 26, has been appointed Secretary to the Southern Railway Company, was born in 1897. He was educated at Bedford School and the Royal Military Academy, Woolwich, whence he was commissioned to the Royal Engineers in October, 1915. During the war he served in France and afterwards in the Iraq insurrection in 1919-20, when he was awarded the M.B.E. He returned home in 1921 for a two years' course at Cambridge University and the School of Military Engineering, Chatham. During the years 1923-26 he served in the Engineering Department of the Indian State Railways on maintenance, survey and bridgework. Major Dawes then returned to military duty and was for two years (1926-28) Garrison Engineer and Assistant Commander, Royal Engineers, in Baluchistan on construction and frontier roadwork. After undergoing the course at the Staff College, Quetta, he returned home and was thereupon appointed Assistant C.R.E. at York in 1931. During the two years 1932-33, he was Staff Captain, Eastern Command, at The Horse Guards, prior to being appointed General Staff Officer in the Staff Duties Department at the War Office, which position he held until April of this year, when he was offered and accepted the appointment of Secretary to the Southern Railway Company. He therefore retires from the active list and passes to the Reserve of Officers, Royal Engineers.

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Mr. John Stuart Morton, who, since 1927 has been in charge of the new works, block telegraph, accident, telegraph and telephone sections of the office of the Superintendent of the Line, G.W.R., retired from that railway on June 1. His first appointment was to the District Goods Manager's office at Shrewsbury in 1891, and he was subsequently transferred to the Divisional Superintendent's office at Chester. In 1896 he was moved to the office of the Superintendent of the Line, Paddington, and in 1926 took charge of the new works, block telegraph, and accident sections, the telegraph and telephone arrangements being placed under his supervision a year later. Mr. Morton was a lecturer at the Paddington School of Signalling from 1903-22, having been one of the original lecturers when it opened in the former year. He was Secretary of the Great Western Railway Rules and Regulations Committee from 1923 until his retirement, and a member of the Rules and Regulations Committee of the Railway Clearing House from 1923 to 1936, during which period the Rule Book was revised. He was also a member of the sub-committee which was formed to consider the question of the standardisation of colour-light signalling. Mr. Morton was intimately associated with comprehensive works carried out in recent years, including the enlargement of Paddington, Bristol (Temple Meads), Cardiff, and Taunton stations, extensive quadrupling in the West of England, and the remodelling of stations and accommodation at Penzance, Plymouth, Exeter, Paignton, Banbury, Oxford, and elsewhere.

***Mr. J. S. Morton,***
Office of the Superintendent of the Line, G.W.R. 1896-1936

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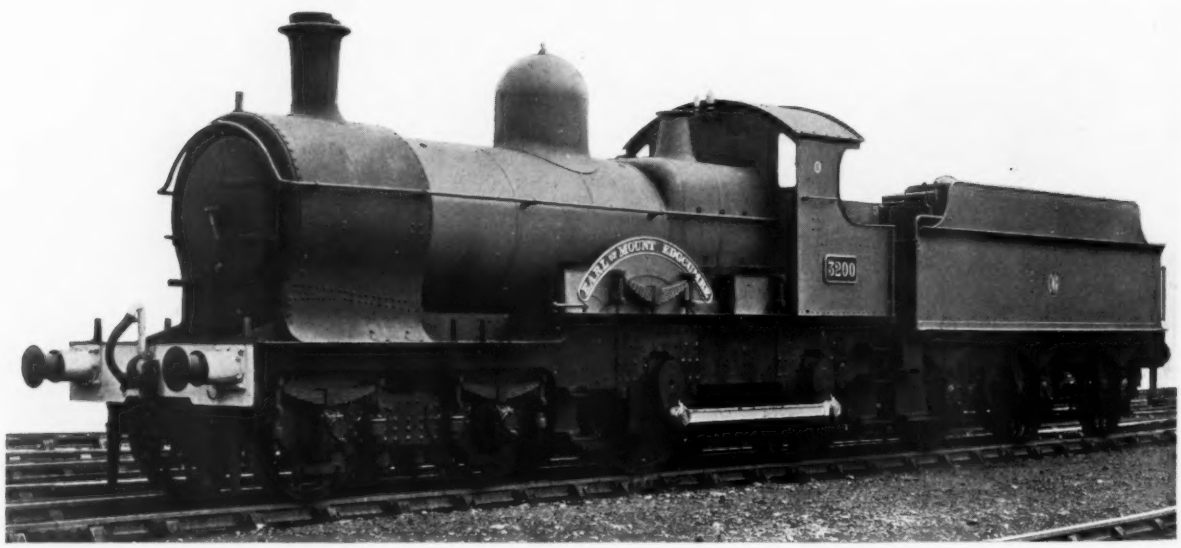
As we briefly recorded last week, Sir James Arthur Salter, K.C.B., D.C.L., has been appointed by the Minister of Labour to be Chairman of the Railway Staff National Tribunal. The constitution of this tribunal and the method of appointing the chairman are set out under the heading of Railway Staff and Labour Matters on page 65.

Sir Arthur Salter became an Assistant Secretary to the National Health Insurance Commission in 1913. During the war he was successively Assistant Director of Transports, Director of Ship Requisitioning, Secretary of the Allied Maritime Transport Council, and Chairman of the Allied Maritime Transport Executive. From 1920 to 1922 he was General Secretary of the Reparations Commission. Both before

***Sir Arthur Salter, K.C.B., D.C.L.***
Appointed Chairman, Railway Staff National Tribunal

*Above: Group taken at the Permanent Way Institution Summer Convention at Plymouth last week-end (see news article on page 70). In the middle of the front row is Mr. W. K. Wallace, the President, with Mr. R. Carpmael, Past President, on his right, and Mr. S. E. McLewin, Secretary, on his left*

*Left: Interior of show train displaying the products of British Insulated Cables Limited, now on a provincial tour*




*The first of the "Earl" class light 4-4-0 passenger locomotives which the G.W.R. is building in replacement of "Bulldogs" and "Devons" for light-axle-load routes (see editorial note on page 39)*

and after that period he was Director of the Economic and Finance Section of the League of Nations. He was Chairman of the Road-Rail Conference in 1932, and since then he has been a member of the Economic Advisory Council. For distinguished services, Sir Arthur was made a C.B. in 1918, and a K.C.B. in 1922; he is also the holder of Belgian, French and Italian decorations.

### Indian Railway Staff Changes

Mr. H. D. Furley, Chief Operating Superintendent, N.W.R., has been granted three months' leave as from June 5. Mr. C. C. T. Bereton, M.B.E., has been appointed to officiate in his place, and is succeeded as Divisional Superintendent, Lahore, by Mr. T. C. Hales, hitherto Deputy Chief Commercial Manager, whose place is taken by Mr. W. T. Biscoe.

Mr. R. H. Middleton, Chief Engineer, B.B. & C.I.R., has been granted five months' leave as from April 18, and Mr. A. Watkins has been appointed to act for him: Mr. A. H. M. Campion acts as Deputy Chief Engineer in place of Mr. Watkins.

Mr. F. J. Sievwright, District Traffic Superintendent, Ajmer, and sometime Acting General Traffic Manager, B.B. & C.I.R., has retired after 38 years' service with that company.

Dr. S. A. Wilkinson has been appointed Chief Medical Officer, B.B. & C.I.R.

Mr. E. A. Cole, Acting Deputy Agent, A.-B.R., has been granted leave as from May 30, and Mr. N. H. Lewis, Deputy Chief Auditor, has been appointed to act as Deputy Agent in his place.

### South African Railway Officers in London

In addition to Mr. T. H. Watermeyer, General Manager, a number of South African Railway officers are at present on a visit to this country, including: Mr. W. E. Turnbull, Assistant Manager, Durban; Mr. W. A. Moyers, Chief Civil Engineer; Mr. James Lindsay, Port Superintendent, Cape Town; Mr. C. M. Hoffe, Chief Staff Superintendent; and Mr. C. H. Hamilton, Superintendent, Operating and Commercial, Kimberley.

### Nigerian Railway Staff Changes

Mr. F. H. Down has been appointed to act as Chief Storekeeper as from April 11.

Mr. L. E. Steventon has been appointed to act as Superintendent of the Line as from February 29.

Señor José Moreno Ossorio, Count Fontad, has been elected to fill the post of President of the council of administration of the Northern of Spain Railway. Señor Moreno Ossorio was for some years General Manager of the Northern Railway until he retired, at his own desire, on pension, when he joined the board of directors. He now fills the post rendered vacant by the death of the late Marquis Alonso Martinez.

### L.M.S.R. Appointments

The following appointments have been approved by the directors:—

*Chief Commercial and Chief Operating Managers' Departments*

Mr. F. J. Stallard, Stationmaster, Low Moor, to be Stationmaster, Bradford (Forster Square); also in charge of Bradford, Trafalgar and Manningham depots.

Mr. J. L. Woodcraft, Stationmaster and Goods Agent, Shipley; also in charge of Saltaire, to be Stationmaster, Low Moor.

*Chief Operating Manager's Department*

Mr. H. Capstick, District Controller, Kentish Town, to be Divisional Controller (Freight Services), office of Divisional Superintendent of Operation, Derby.

Mr. J. H. Westwood, District Controller, Chaddesden, to be District Controller, Kentish Town.

Mr. F. H. Rhodes, District Controller, Rowsley, to be District Controller, Chaddesden.

Mr. J. Waters, Head Office Inspector (Freight Services), office of Divisional Superintendent of Operation, Derby, to be Assistant Divisional Controller (Freight Services), office of Divisional Superintendent of Operation, Derby.

Mr. C. B. Whittaker, Assistant Divisional Controller (Passenger Services), office of Divisional Superintendent of Operation, Crewe, to be Divisional Controller (Passenger Services), office of Divisional Superintendent of Operation, Derby.

Mr. J. A. Cotterell, Assistant District Controller, Willesden, to be Assistant Divisional Trains and Senior Passenger Timetable Clerk, office of Divisional Superintendent of Operation, Crewe.

Mr. E. Bullard, Controller, office of Divisional Superintendent of Operation, Crewe, to be Assistant District Controller, Willesden.

Mr. S. T. Fawkes, Assistant District Controller, Leeds, to be Assistant District Controller, Chaddesden.

Mr. W. B. Bachelor, Assistant District Controller, Staveley, to be Assistant District Controller, Leeds.

*Signal and Telegraph Engineer's Department*

Mr. T. Guest, Assistant (Locking and Design, Mechanical), Euston, to be Assistant (Signals), Crewe.

*Scottish Changes*

Mr. W. Gourley, Assistant in Maintenance of Way and Works, Divisional Engineer's office, Glasgow, to be District Engineer, Edinburgh.

Mr. J. Stewart, Stationmaster and Goods Agent, Lanark, to be Stationmaster, Dundee (West); also in charge of Magdalen Green.

An interesting function was held at the Royal Hotel, Paddington station, on June 30, when the members of the G.W.R. Junior Officers' Luncheon Club entertained Mr. J. F. Lean, O.B.E., Principal Assistant to the General Manager, and Mr. G. J. Walker, Manager of the Hotels, Refreshment Rooms and Dining Cars Department on the occasion of their retirement from the company's service. After a number of felicitous speeches, Mr. P. W. Pine, Assistant Solicitor, presented Mr. Lean on behalf of the club with a silver cigar box, on which were inscribed the signatures of the club members, and Mr. Walker was presented with a set of machine tools for his hobby of model making.

On July 6, Sir James Milne, Kt., K.C.V.O., C.S.I., General Manager, Great Western Railway, entertained the members of his staff to a luncheon during which, in a very happy speech, he expressed to Mr. Lean the good wishes of his colleagues and presented him on their behalf with an engraved silver salver.

Important Extensions to the L.N.E.R. Fish Docks.—The L.N.E.R. fish docks at Grimsby and Hull are to be extended and improved. At Grimsby a new reinforced concrete quay with a two-storey market 790 ft. long by 92 ft. 3 in. wide will be constructed along the south side of No. 2 fish dock, and will provide berthing accommodation for seven large trawlers, together with the necessary facilities for marketing the fish landed. A portion of the market on the south-west quay of No. 2 fish dock which was destroyed by fire in the winter of 1934 is also to be reconstructed. This scheme provides for the complete re-alignment of the quay, which will extend the berthing accommodation to provide for three vessels. At Hull the St. Andrews fish dock is to be further extended westwards to a length of 1,250 ft., giving an increased water area of 5 acres, making the total water area for the fish docks 23½ acres. When completed this will be the largest fish dock in Great Britain. The passage between the present St. Andrews Dock and the existing western extension is to be widened from 35 to 50 ft., and the new extension will be equipped on the north side with a quay 1,000 ft. long and 92 ft. wide. The scheme also provides for 5 new slipways for hauling the largest trawlers out of the water. 400 ft. of quay on the south side of the new extension dock is to be provided for the purpose of fitting out trawlers. Incidental to this scheme are many works of some magnitude, including the widening of the roadway behind the fish quay, the construction of a new road by means of an overbridge from St. Andrews Dock to West Dock Street, which will involve the diversion of the old Hull & Barnsley Railway for a short distance. These schemes have been formulated under the programme of the Government Assistance Loan.

XUM

# Problems of South Wales

## Sir Robert Horne meets leading industrialists and discusses Government assistance — Representative committee formed

A free and spirited discussion of the industrial plight and difficulties of South Wales and Monmouthshire and suggested ways and means of improving the position, arose from a conference of leading trading and other interests in those areas, held, on the initiative of the Chairman of the Great Western Railway Company and his colleagues, at Paddington station on Wednesday.

The following are among those who attended the conference :—

Sir John Beynon, Bt., C.B.E., Chairman, Fernhill Collieries Limited ; Sir Clifford Cory, Bt., J.P., D.L., Chairman and Managing Director, Cory Brothers Limited ; Mr. John Elliot, Chairman, Dry Dock Owners' and Ship Repairers' Federation ; Alderman G. Frederick Evans, Christopher Jones & Company ; Messrs. Finlay A. Gibson, Monmouthshire and S. Wales Coalowners' Association ; Edmund L. Hann, Joint Managing Director, Powell Duffryn, Associated Collieries ; N. Humphreys, Chairman, Cardiff and Bristol Channel Pitwood Importers' Association Limited ; Sir Samuel Instone, Chairman, Bedwas Navigation Colliery Limited ; Mr. J. P. Johns, General Manager, Cory Brothers Limited ; Sir Stephenson Kent, K.C.B., Stephenson Clarke and Associated Collieries Limited ; Mr. W. North Lewis, J.P., Chairman and Managing Director, Insoles Limited ; Sir David R. Llewellyn, Bt., Director, Amalgamated Anthracite Collieries Limited ; Messrs. N. J. McNeil, Vice-President, Cardiff Chamber of Commerce ; H. H. Merrett, Chairman, British Briquettes Limited ; W. Mordey, Mordey Son & Company, Newport ; John Moxon, Chairman, Newport Parliamentary Committee ; John Paton, J.P., Chairman and Managing Director, Partridge Jones & John Paton Limited ; D. Rupert Phillips, Franklin Thomas & Co. (1930) Ltd. ; The Rt. Hon. The Earl of Plymouth ; Mr. J. C. Radcliffe, Chairman, Cardiff and Bristol Channel Shipowners' Association ; Sir Alfred Read, J.P., Chairman, Coast Lines Limited ; Sir William R. Smith, Bt., Sir W. Reardon Smith & Sons Ltd. ; Messrs. Arthur L. Horner, President, South Wales Miners' Federation ; E. H. Watts, Watts, Watts & Company ; L. D. Whitehead, D.L., J.P., Managing Director, The Whitehead Iron & Steel Co. Ltd. ; Sir Robert Webber, J.P., *Western Mail* ; Sir Evan Williams, D.L., J.P., Powell Duffryn Associated Collieries Limited ; Lt.-Col. Sir Rhys Williams, Bt., K.C., D.S.O. ; Messrs. W. D. Woolley, J.P., Tredegar Iron & Coal Co. Ltd. ; and Iestyn R. Williams, Assistant Secretary, Monmouthshire, and South Wales Coal Owners' Association.

*Members of Parliament.*—Mr. D. Owen Evans (Cardigan) ; Capt. Sir E. N. Bennett (Cardiff Central) ; Mr. Aneurin Bevan (Ebbw Vale) ; Sir R. G. Clarry (Newport) ; Mr. D. L. Davies (Pontypridd) ; Mr. George Daggar (Abertillery) ; Capt. Arthur Evans (Cardiff South) ; Sir Chas. Edwards, C.B.E. (Bedwellty) ; Messrs. J. Griffiths (Llanelly) ; G. H. Hall (Aberdare) ; Will John (Rhondda West) ; Lewis Jones (Swansea West) ; A. Jenkins (Pontypool) ; Sir W. Jenkins (Neath) ; Messrs. W. H. Mainwaring (Rhondda East) ; and P. M. Munro (Llandaff and Barry).

Sir Robert Horne, G.B.E., K.C., M.P., opening the proceedings emphasised the national importance of the problem and the urgency of seeing if something more effective could not be done, some greater help given by the Government, than had yet resulted from the untiring efforts of the local M.P.s and other bodies which were struggling with the problem.

" In making these observations, I am not forgetting certain favourable features which are already coming into being. The Government has announced its intention of establishing near Bridgend a munitions factory which will certainly bring some work to the surrounding community, and the Air Ministry is taking measures to set up new establishments in South Wales. The iron and steel trade, under the leadership of courageous men, has recently made a great advance and may be said to be thriving successfully. Ebbw Vale, with regard to which hope might be said to have been lost, is to be started up again under very enterprising and skilful management and a new life has been breathed into that district. And there are many subsidiary industries on the way which, though small in themselves, will, in the aggregate, produce an appreciable effect. In no realm more than in human employment is it true that ' every little counts.'

" But, when all that is said, the fact remains that South Wales is a mere simulacrum of its previous self. The core of the South Wales problem is coal : and not so much the internal traffic in coal, which has been helped by the encouraging factors which I have mentioned, as the export of coal. The mines of South Wales, its railways and docks, its population and prosperity, were built up on the export of coal. And for many purposes it was the finest coal in the world, sought after and demanded for raising steam in every quarter of the Globe. Before the days of oil, South Wales coal was King.

" But these are different days. The great liners burn oil : and many smaller craft as well. A great Liverpool group has recently announced the conversion of a considerable fleet to the use of oil. In foreign depots where there used to be stacks of Welsh coal, you now find a row of oil tanks. The ' scrap-and-build ' policy of the Government very often results in the scrapping of a coal-burning vessel and the building of one which burns oil.

" Moreover, difficulties of exchange, restrictions on import and foreign competition have hit the export coal trade very hard. To add to these embarrassments, political controversies with Italy have injured South Wales more than any other part of the United Kingdom, and, up till now, the Government's trade agreements about coal.

" I shall venture to give you a few statistics to show what has happened, and I ask you to keep in mind that outside of the unhappy Special Areas, Great Britain has been progressing to a degree which has made it the envy of the world. The number of rating areas in which rates exceeded 20s. in the pound has increased from 20 in 1934-35 to 27 in 1935-36, all but one of which are in South Wales and Monmouthshire. These figures alone will give you the contrast with the most-part of the country. Behind them lies the tragic story of loss of work and loss of happiness in South Wales.

" Although the total output of coal in Great Britain has increased to the extent of over 10½ million tons per annum since 1933, it is in Monmouthshire and South Wales alone that the total trade has declined. In 1923 19·6 per cent. of the output of coal in Great Britain was produced in Monmouthshire and South Wales but in 1935 only 16·1 per cent. Had the fair share of the improvement in trade reached South Wales, and had the percentage been maintained at even the 1929 level of 18·7, nearly six millions more tons of coal would have been produced in the area, giving direct employment to 24,000 more miners and indirect employment to a large number of other men. Today the picture does not become more hopeful. Shipments of coal from the Bristol Channel ports for the first five months of the current year show a further decrease of 1,155,000 tons compared with even the low level of the corresponding period of last year. The docks of South Wales are not earning enough revenue to meet their running expenses.

" Some of the reasons for this state of matters are obvious enough. In 1934 South Wales exported 884,000 tons of coal to Italy. In 1936 it has exported 13,000 tons. Germany, on the other hand, which sold to Italy 1,664,000 tons in 1934 increased her export to Italy by a million tons. There is a strong case for claiming that an area which is specially hit by national policy should be specially supported by the nation.

" In other directions it can be cogently urged that trade agreements should be made with a clear regard to the plight of Welsh coal. There are numerous countries which get a better reception in our markets than we enjoy in theirs, whose purchases of Welsh coal are immensely less than in previous years, such as the Netherlands, Brazil, Argentina and Egypt. There is room for a bargain in such instances. And perhaps we have something to learn from Germany which has been capturing many of our markets. Germany, I am informed, gives a direct subsidy of 2½ renten marks a ton on German coal exported from her shores, and in addition makes a levy upon her inland coal in favour of her export coal, which creates for it a subvention of another 4 renten marks a ton. I know of no way of meeting such competition except by similar measures.

" Germany some time ago obtained a coal contract for the Italian State Railways at a price 1/6d. a ton less than the fixed minimum at which we sell the kind of Welsh coal which these railways used to employ. Consider how we play into Germany's hands.

Our minimum price is published and known to all the world. All that is necessary is for the German to quote a lower price relying upon his subsidy to see him through. I hope, as the result of our deliberations, we may find some remedy for that situation.

"But while our attention must be chiefly centred on the export trade, we must not neglect other measures for increasing the consumption of Welsh coal. If oil has been ousting coal, let us make oil from our own coal. That method which will produce most oil has obviously the greatest advantage and some system of hydrogenation most applicable to the Welsh class of coals ought to be set up. But low-temperature carbonisation ought also to be practised. I entirely disagree with those who think that it will not add to the amount of coal consumed for reasons which I have not time to argue now. The Government has recognised the need of financial assistance for getting the Special Areas out of the morass in which they are at present sunk, and has set up a company to make advances of Government money in appropriate cases. I hope that much larger sums will be made available for this purpose and that the measures which I have suggested for the better treatment of coal will receive adequate support.

"I have hitherto dealt entirely with coal, for, as I have said, coal is the crux of the South Wales problem, but we shall, I hope, all be thinking of other methods of resuscitation as well. It is difficult to tempt new industries to come to a district where rates are high. The Government has it in its hands to place orders in the Special Areas and to make its contractors similarly place their orders in turn. And many of us will, perhaps, be able to follow the same course. The Great Western Railway has during this depression spent an increasing proportion of its receipts in South Wales. Our expenditure in the South Wales area last year was over £8½ millions, and I hope you will remember that we are one of the depressed industries in South Wales, sharing its misfortunes in as acute a degree as any and bearing a large proportion of its burden of rates. It may be possible to attract new industries by all of us arranging to spend as much as possible upon industries set up within the area, and as work spreads rates will come down and one of the most formidable disabilities be removed.

"There are many other avenues—industrial, agricultural, and horticultural—which we must explore with hope in our hearts. The times are now much more propitious for progress than they were, and the public conscience is more sensitive to the desperate needs of the less fortunate districts of the country. This is the moment for a new start. Let us today, in this room, give a lead, if we can, to fresh action."

Sir Robert added that, in their view the proposed Severn Bridge would not add appreciably to any traffic coming into South Wales. If three million pounds were to be spent, he thought it would be better used in such way as to subsidise the export coal trade of South Wales or to build a great oil from coal plant.

Mr. Edmund L. Hann, Joint Managing Director of the Powell Duffryn Associated Collieries, endorsing the chairman's remarks as to the great loss in Welsh export coal trade and the rise in Germany's coal export trade, said the latter country, he thought, had two main objects, namely, maintaining as many men as possible in employment and making sure of adequate supplies in time of war. Might not the same reasoning be applied to this country. Speaking of the effect of German barter agreement, &c., on South Wales, he said that in one place practically a whole valley had been rendered idle owing to the foreign policies of Great Britain. Was it fair? He suggested that as much transport as possible should be done by coal, and mentioned the possibilities of a small tax on petrol for one year to provide for the installation of an oil-from-coal plant with its consequent help to employment.

Sir Charles Wright spoke of the assistance rendered to the steel trade by protection and said they looked to South Wales and Monmouthshire for 20 to 25 per cent. of the steel output of the country; the prospects of an increase of which were good.

Mr. Edmund H. Watts, Chairman of Watts, Watts & Co. Ltd., said the whole question of transport was a national one. He strongly advocated the case for stronger trade agreements with other countries. They must put British trade interests first and foremost or they would lose their markets year by year. He gave examples of shipowners' losses due to foreign trade agreements, singling out for special mention countries with which we were competing and which had no intention of using British coal unless they were made to. He added that when finance left this country we should take care that it was not used in competition against us.

Sir John Beynon, Bt., C.B.E., Chairman of Fernhill Collieries Limited, drew a gloomy picture of the ways in which the coal markets had been taken away from South Wales by the competition of countries with State aid, cheaper labour costs, by political troubles and by losses through sanctions.

Mr. Arthur L. Horner, President of the South Wales Miners' Federation, endorsed the efforts that were being made to help the coal trade but said that while the other speakers spoke from the point of view of their respective industries with which they were associated and were concerned with their investments, those for whom he spoke were concerned with the security of their homes and very existence. He urged the unification of mining interests throughout the country, and the absorption of so called "surplus" labour by provision for pensions and a larger period at school for boys. Their interests, he contended, had been largely sacrificed in the interests of so-called national policy and financial operations.

Sir Evan Williams, Powell Duffryn Associated Collieries Limited, said that as regards inland trade there was no reason why South Wales should not regain its share, but as for export trade he did not think things would improve sufficiently while they were up against State aided foreign competition, unless they had the same means at their hands. National support and effort were essential.

Sir David R. Llewellyn, Bt., a Director of the Amalgamated Anthracite Collieries, Limited, said he envied the recovery and present position of the steel trade. The South Wales coal position was really desperate. They must be armed with the same weapons as the Germans. Every government had been content to see the coal trade dwindling away up to the present. The most important thing of all was volume of business—he suggested that if the transport undertaking would help them over costs he was sure they would recoup themselves.

Lord Portal mentioned the great difficulty to make people who lived outside South Wales realise the conditions there, and spoke of the burden of rates and variations arising from the difference of some things being treated on a local basis and others on a national. If a tariff or subsidy would help unemployment then it should be justified.

Sir R. G. Clarry, M.P. for Newport said they had already an active committee working in Parliament, without any party differences, and they were going to redouble their efforts for another big push.

Mr. G. H. Hall, M.P. for Aberdare, suggested that a big uniform effort was needed to bring the condition of South Wales before the Government and the country. Up to the present several separate committees, each working in its own way, had endeavoured to do this, but there had been no co-ordinated uniform effort.

It was resolved to appoint a committee with power to co-opt any and every person they thought could be of assistance to the work to be done and on this decision the meeting terminated.

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NEW 2-8-2 PASSENGER LOCOMOTIVES, L.N.E.R.—In our description of the vacuum brake apparatus fitted to the new 2-8-2 type passenger locomotives for the L.N.E.R. (page 12 of our issue for July 3), it should have been stated that there are four 21-in. diameter cylinders on the engine and two 21 in. diameter cylinders on the tender.

# THE MONTH'S RAILWAY LAW

## Railway Station Shops Assessment

*Westminster City Council* v. *Southern Railway Company* (*The Times*, May 22)

Among the many difficult questions raised by the Railways (Valuation for Rating) Act, 1930, perhaps the most debatable was the case of the bookstalls, shops and offices which form that part of railway station premises let out to tenants. Are these railway hereditaments to be entered on the railway valuation roll, or are they to be rated separately in the usual way? Mr. Justice Mackinnon held that this question was governed by a previous case in which the position of Smith's bookstall at a railway was considered, and that the shops and stalls were in railway occupation (*Smith* v. *Lambeth Assessment Committee* 10 Q.B.D. 327). The other members of the Railway and Canal Commission (Sir Francis Taylor and Sir Francis Dunnell) also held that the tenants had only a subordinate occupation, and that the railway company was the paramount and exclusive occupier and was therefore rateable. They laid stress on the fact that the company had sole control of the entrance to the station, and therefore that the shopholders were not in the position of ordinary tenants.

## The Premises at Victoria

The House of Lords last month gave its decision reversing this view. It held with regard to the shops at Victoria that they were capable of separate occupation, and that the right of occupation was in the shopkeepers, who had the keys and left their goods there when they went home at night. The railway company of course contended that the shopkeepers were only in the position of lodgers in a house, the landlord having the paramount occupation of the whole. But the company was not successful in that contention, because the House of Lords ruled that this contention involved a confusion between the station itself and the premises upon it. It was true that the railway company retained control over the access and egress to the shops by its by-laws and regulations but this only resembled the restrictive covenants which bind a tied public house, or (in the case of private houses) forbid the carrying on of a trade or business. On the view of their lordships, the tenants of the shops were in sole occupation and had full use of them to carry on the business.

## W. H. Smith and Son's Bookstalls

The case of the bookstalls was perhaps the strongest case for railway assessment, because the company's bookstalls had always been regarded as being part of railway premises. But no exception was made in the House of Lords judgment as to them, and here again they were held to be capable of separate assessment and to be excluded from the roll of railway hereditaments. This involved the overruling of *Smith* v. *Lambeth Assessment Committee* (supra) on which the Railway & Canal Commission founded its judgments. But the House of Lords did not shrink from this course, and so that old-standing authority is no longer good law. The house thought that it would create an anomaly if W. H. Smith & Son's bookstalls were treated differently from other shops and offices at Victoria, and ruled accordingly.

The same result was reached in the case of show-cases at Victoria and the warehouse and storage premises at Beckenham junction. None of them are to be assessed as part of the railway hereditament occupied for the purposes of a railway undertaking under section 1 of the Act, but will be assessed by the local authority in the usual way.

## Tax on Debenture Interest

*Inland Revenue* v. *Central London Railway* (*The Times*, May 21).

The Central London Railway Company in 1930 issued 5 per cent. redeemable debenture stock to pay for constructional work, and had powers from the Board of Trade to charge the interest thereon to capital account for a period of five years. On paying the interest to the stock holders for 1930, the company deducted tax thereon, and claimed that it was entitled to retain this and not bound to account for it to the Crown. Part of the interest, amounting to £1,909 18s. 1d., was charged to revenue account, and no question arose as to this. But as to £2,380 1s. 11d., the balance of interest, this was debited to capital account by the company and it was claimed for the company that this was payable wholly out of profits or gains brought into charge to tax (Rule 19 of General Rules). The company said that if it accounted for this to the Crown under Rule 21 as for interest "not payable out of profits and gains brought into charge," it would be subject to double taxation. It is to be observed that the Central London Railway had made profits for the year and paid tax thereon, but not of course on this new constructional work, and therefore it decided to charge interest to the extent of £2,340 against capital. Mr. Justice Finlay held that the company was right, and that the interest must be taken to have been payable out of taxed funds so that the company could keep the tax which was deducted from the stockholders' interest. But upon appeal, the Court of Appeal, and now the House of Lords, reversed this view. Lord Macmillan gave the leading judgment. The right to retain tax is conditional on interest being payable out of profits. If it had been paid out of actual profits, said Lord Macmillan, the sum so paid would have figured in the company's returns in 1931 (the next year). But the £2,340 did not so appear, for it was a payment out of capital. Consequently the Crown would never receive tax upon this interest, unless it was held that the company was accountable to the Crown for the tax deducted. In fact the two processes adopted by the company were inconsistent. They could not (*a*) attribute the £2,340 to the payment of interest to the debenture stockholders, retaining the tax deducted as if paid out of revenue, and (*b*) by debiting the £2,340 to capital, increase the dividend fund and claim to retain the tax deducted from stockholders.

## The Other House of Lords Appeals

The same point as that in the last case was raised in *Inland Revenue* v. *London Electric Railway Company* and it was decided in the same way. In *Inland Revenue* v. *Metropolitan Railway Company* there was this difference, that the company was seeking to recover under Section 36 of the Income Tax Act, 1918 the tax on certain interest paid on money borrowed from the bank, which had been debited to capital account. Here again the arguments were the same, the company contending that the interest had been paid out of profits or gains already brought into charge to tax. But the result was the same in all three cases, the inland revenue authority winning the day as the result of the judgments in the House of Lords.

## Railway Cases in the Courts

Several cases are up for appeal this term from the County Courts, *London & North Eastern Railway Company* v. *Curzon* from Barnet County Court, and *Stammers* v. *London Midland & Scottish Railway Company* from Southend County Court.

There is an appeal, too, from Bloomsbury County Court in *Marshall* v. *London Passenger Transport Board*. An appeal by the railway company in *Baldwin* v. *London & North Eastern Railway Co.* is from an award by Judge Leigh at Manchester County Court, and another by the same company in *Blee* v. *the company* is from an award by Judge McCleary at Clerkenwell. These appeals from awards are in workmen's compensation cases, and it will be noticed that all appeals from County Courts now go straight to the Court of Appeal, and not to the Divisional Court on the King's Bench side.

There are also appeals pending to the Railway and Canal Commission from the Railway Assessment Authority by the Southern Railway Company and the London & North Eastern Railway Company.

## New Exceptional Rates

*Great Western Railway Company* v. *Henry R. James & Sons Ltd.* (June 16, 1936).

The process of granting and fixing a new exceptional rate under the Railways Act, 1921, Section 37, was discussed in *Great Western Railway Company* v. *Henry R. James & Sons* (reported in the new All England Reports,

vol. 2, p. 660). A rate is granted, *i.e.*, when it is agreed to by the railway company. It is "fixed" by the Rates Tribunal at the instance of an individual trader, and the Tribunal may give its "consent" to a new exceptional rate, when the rate is more than 40 per cent. below the standard rate. In other cases no consent is required, but the company may grant the rate, and must then report its terms to the Minister. There appears to be no objection to the exceptional rate being charged before this report is made. The words "grant" and "charge" mean apparently the same thing, the "charge" being the "grant" put into operation. In the particular case the Great Western Company had entered the rate in the rate book, which is an essential preliminary to the charge coming into force. But it had not obtained the consent of the Railway Rates Tribunal. This was necessary because the new rate was more than 40 per cent. below the standard charge. It was not therefore entitled to charge the rate of 13s. 2d. which it claimed to charge. The defendants were in an equal difficulty, because the rate of 10s. 9d. which they claimed to apply had been sanctioned by the Tribunal in 1930 but it had not been entered in the company's rate book and had not therefore been "granted" by the company. It is clear according to the Court of Appeal that the "grant" of an exceptional rate and the entry in the rate book by the company should be simultaneous, if it is to comply with the conditions of the section.

## Railway Staff and Labour Matters

Following the meeting of the Railway Staff National Council on June 30, the National Union of Railwaymen and the Railway Clerks' Association intimated to the railway companies their intention of referring their claims to the Railway Staff National Tribunal.

The agreed Machinery of Negotiation which came into operation on March 1, 1935, provides for the establishment of a Railway Staff National Tribunal consisting of three members. One member is to be nominated by the railway companies, but no director or official of the railway companies or of the joint lines or of the Railway Clearing House is eligible for appointment as a member of the tribunal. A second member of the tribunal is to be nominated by the three railway trade unions, but no official or member of such unions is eligible for such nomination. The chairman of the tribunal is "to be appointed by agreement between the railway companies and the railway trade unions, or, failing agreement, to be appointed by the Minister of Labour, after consultation with the parties."

During recent months the question of the appointment of a chairman has been the subject of talks by the special joint committee which framed the machinery but, as it was not found possible to agree on a particular name, the joint committee decided to request the Minister of Labour, Mr. Ernest Brown, M.C., M.P., to make the appointment. Consultation with the parties followed and on Wednesday of last week, July 1, it was officially announced that the Minister had appointed Sir Arthur Salter, K.C.B., D.C.L. to be the Chairman of the Railway Staff Tribunal. A portrait and brief biography of Sir Arthur appear on page 59.

During the past week terms of reference have been agreed, statements of claims and defence have been prepared by the parties to the issue, and these have been forwarded to the tribunal and arrangements have been made for the hearing of the cases to begin at Montagu House, S.W.1, on Wednesday, July 15.

The railway companies have nominated Mr. A. L. Ayre, O.B.E., J.P., and the trade unions have nominated Mr. J. W. Bowen, J.P., as independent members of the tribunal. The Railway Companies have nominated Sir Ralph L. Wedgwood, C.B., C.M.G., Chief General Manager, L.N.E.R., and Mr. G. L. Darbyshire, Chief Officer for Labour and Establishment, L.M.S.R., to be assessors, and the trade unions have nominated as assessors Mr. J. Henderson, J.P., M.P., President, National Union of Railwaymen, and Mr. F. B. Simpson, M.P., President, Railway Clerks' Association. It is understood that the case of the trade unions will be presented by Mr. John Marchbank and Mr. W. Stott, respectively. Mr. Kenelm Kerr, O.B.E., Assistant General Manager (Staff), L.N.E.R. Railway, and Chairman of the Railways Staff Conference, will appear on behalf of the railway companies.

## French Railway Publicity

French railway poster artists still appear to pin their faith mainly to pictorial appeal, and as few travellers have time to appreciate subtlety of composition or phraseology, their efforts are doubtless as successful as other styles of such publicity. We have received a series of posters from the P.L.M. and P.O.-Midi Railways in which this principle is characteristically exemplified, the most attractive scenes being carried out with a rich sobriety of colouring. Just as a straining after effect is avoided in the letterpress (usually confined to the name of the company and the place represented), so is vividness of tint eschewed.

The range of interests to which the posters address themselves is wide. Holiday areas are not invariably represented with a bather or rambler prominent in the foreground. Architecture—domestic and ecclesiastical—is handled in a manner to attract both the student and the lover of the picturesque, while universal admiration will be commanded by the fine P.O.-Midi poster illustrating the cable suspension railway at Artonste. This very striking composition won the challenge cup and gold medal at the International Tourist Poster Contest in 1935. The P.O.-Midi posters have small inset maps showing the situation of the places depicted, and the railway route from Paris. Some of them are produced with the letterpress in English.

From the P.L.M. Railway we have also received a series of illustrated folders and booklets either produced by the company or by the resorts and places of interest it serves. From Dijon, for example, there comes an excellent historical and present-day guide to the city, and from Cannes a photogravure folder in English showing every phase of sport and recreation in which the visitor may indulge. The P.L.M. company itself has produced an illustrated folder guide in English to Morocco, with attractive coloured cover, and the Northern Railway of France sends us a miniature pocket gazeteer in English to the coastal resorts it serves.

THE G.W.R. DREDGING FLEET.—For some years past the dredging fleet of the G.W.R. has included three self-propelling grab dredgers, namely, the *Mudeford*, *Francis Gilbertson*, and *Basingstoke*, but the last-named vessel has reached the end of her economic life and is now on the disposals list. She has been replaced by the *Graball*, which has been purchased from the James Dredging, Towage & Transport Co. Ltd. The *Graball*, which was built last year by Alexander Hall & Co. Ltd., of Aberdeen, is also a self-propelling grab dredger, with a gross tonnage of 339·95 and a net tonnage of 132·92; although slightly smaller than the *Basingstoke*, she is larger than the *Mudeford* and *Francis Gilbertson*. Her length is 125·4 ft., breadth 30·15 ft., depth 11·1 ft., and dredging capacity 100 cu. yd. an hour.

SCHEDULE OF B.S. SPECIFICATIONS FOR BUILDING WORKS.—The British Standards Institution has just issued a revision of the schedule of B.S. Specifications applicable to building work, copies of which (CD. 4000) can be obtained from the Institution, 28, Victoria Street, London, price 8d. post free.

# RAILWAY AND OTHER MEETINGS

## Great Southern of Spain Railway Co. Ltd.

The ordinary general meeting of the Great Southern of Spain Railway Co. Ltd., was held at the company's offices, 2, Broad Street Place, E.C.2, on June 29, Mr. C. H. Pearson, Chairman of the company, presiding.

The Secretary (Mr. F P. Higgs) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that the working results continued to reflect the serious effect of the withdrawal at the end of 1928 of the Spanish Government's financial assistance to meet burdens arbitrarily imposed. Of the drop of £27,828 in receipts in comparison with 1934, mineral traffic accounted for roughly two-thirds, as the iron ore mines continued closed down and only a nominal tonnage was transported after the accumulated stocks were exhausted in the middle of the year. The remaining one-third was attributable to a decline in merchandise traffic, in respect to which the effect of increasing road competition necessitated the introduction of a number of special reduced tariffs, and in this connection he might mention that the operation of the decree for regulating the collection of taxation on transports by road had been suspended, and the intensive "pirate" traffic on the roads continued. The reduction in working expenses had only been achieved by the most extreme measures of economy and also by continuing to defer all expenditure not immediately essential, but in no way was it possible to reduce working expenses to a degree corresponding to the reduction in receipts.

In 1920 the Spanish Government imposed on the railways large increases in wages, and undertook as a temporary expedient to make up by cash advances the additional expenditure involved, pending a solution of the railway problem as a whole. This aid terminated altogether at the end of 1928, without the substitution of any other scheme to continue the promised assistance to cover the increased wages, with the consequence that, since the beginning of 1929, this entire burden had rested upon the railway companies, and they had also had to bear other subsequent impositions on expenditure arising principally from legislation of a social character. In the case of this company, the withdrawal of the Government financial support coincided with the prolonged and serious falling off in the iron ore traffic, and the Spanish Government was repeatedly memorialised with regard to the seriousness of the situation and the reasons therefor, but without result. Had the undertakings of the State to provide the means to meet the 1920 wage increases been implemented in full, the amount which would have been due to the company at the end of last year was computed at something like pesetas 6,000,000, or £164,000 at the present rate of exchange. If the Government assistance had continued, the company would have been able to deal with what was hoped to be only an interregnum, although a very prolonged one, in the business of the transport of iron ore, its basic source of revenue. What this traffic meant was eloquently demonstrated by quoting the transports of 693,341 tons of iron ore in 1929 and 74,840 tons last year, barely 11 per cent., or in money £142,373 compared with only £14,706. Then, too, the stoppage at the mines was partly responsible for the decline in merchandise traffic.

In these circumstances the Government was notified on May 31, 1935, that after June 15, it would not be within the Company's power to pay the wages of the establishment at the existing rates, and it was pointed out that the expenses would necessarily have to be limited by the amount available from transport earnings. In the notification it was demonstrated that the position described was directly and indirectly attributable to the failure of the Government to implement its undertakings.

The presentation of this document was followed by a visit to the line of an official commission of investigation, which, at the end of July, 1935, reported favourably as to the granting of aid to the company, subject to the appointment of a local board in Spain, submission to the intervention of the State, and certain other conditions. These requirements were duly complied with by August 22, but, as considerable delay arose in the actual granting of the aid, in spite of repeated endeavours to hasten it, the General Manager was constrained under pressure of the local authorities to continue paying the full wages as and when receipts allowed.

It was not until the middle of December that cash was received in the form of a repayable advance of pesetas 120,000, this representing aid for the months of August and September, 1935. The money was paid by a State official direct to the staff. In the meantime, and as the traffic in iron ore still remained virtually at a standstill, an application had been made in November for a continuance of the aid for the three months October to December, and this was followed in February, 1936, by another petition for assistance to bring the position to March 31 up to date.

Further delays on the part of the Spanish Government led to a strike at the end of March, 1936, which was settled by the Civil Governor of Murcia ordering the General Manager in writing to devote the whole of the receipts to the payment of the wages, and in spite of energetic protests against this arbitrary action, which must eventually have resulted in a complete paralysis of the operations of the railway, about three weeks elapsed before the order was annulled. On April 28, as wages had again fallen into arrears another strike took place, but was settled after a week's complete stoppage by the men accepting a promise of payment of the wages subject to the State aid being received, and certain minor concessions. Early in May a part of the aid asked for in February was received, a State official again supervising its expenditure in wages, and, in the same month, still another application was presented for increased assistance for a further period April to June. He might mention that whereas the amount of the original advances for wages was only a contingent liability dependent upon the results of each year's working, the aid now being accorded was to be repayable out of the first liquid receipts of working and in the maximum amount fixed by the before-mentioned State intervention. Unfortunately, owing to the length of time elapsing before the aid was available and the insufficiency of the amount received, and to a further serious decline in traffic receipts, it had now become extremely difficult, after meeting essential outgoings, and with the balance of cash available, including what was received as aid, to continue to pay the wages and pensions at full rates even when deferred as long as possible. Consequently the General Manager was obliged on May 25 to address another communication to the Spanish Government notifying that the company could not accept responsiblity for the consequences which might ensue from the failure of the Government to implement its undertakings and from its impositions on expenditure.

The Chairman added some appreciative remarks as to the work of Mr. George L. Boag, the recently-retired General Manager, which we quote on page 57.

The report was adopted.

## Forthcoming Meetings

July 15 (*Wed.*)—**Leopoldina Railway Co. Ltd.** (Annual), Southern House, Cannon Street, E.C.4 at 12.30 p.m.

July 22 (*Wed.*)—**Bombay, Baroda and Central India Railway Company.** (General), Southern House, Cannon Street, E.C., at 1 p.m.

July 24 (*Fri.*)—**Egyptian Delta Light Railways Limited,** (Ordinary General), Winchester House, Old Broad Street, E.C.2, at 11 a.m.

## Forthcoming Events

July 15 (*Wed.*).—Institution of Electrical Engineers, Savoy Place, London, W.C.2. Conversazione and Reunion of Overseas Members.

July 17–20.—Railway Students' Association, at Highfield Hall, University of Southampton. Convention.

# QUESTIONS IN PARLIAMENT

### Railway and Air Tickets

Mrs. Tate, on July 1, asked the Minister of Transport whether, in view of the fact that the Government had guaranteed a loan of 26½ million pounds to the railways for the modernisation of their lines, pressure would be brought to bear upon them to ensure that they would not in future prevent the sale of tickets for air lines other than railway air lines at travel agencies in this country.

Mr. Hore-Belisha.—The terms of the agreement to which the hon. lady refers were settled and approved by Parliament last year.

### Railways and Roads in Wartime

Lieutenant-Commander Tufnell asked the Minister for the Co-ordination of Defence whether, in view of the vulnerability of London in regard to receiving supplies during the war, the necessity of keeping the city supplied with food, and the greater risk to railways than to roads through aeroplane attack, he would consider formulating a scheme for organising or planning the adequate provision of roads for conveying supplies from the West Coast or other less exposed ports to the Metropolis.

Sir. T. Inskip.—A special committee is dealing with the whole question of the diversion of imports, their reception at alternative ports, and distribution therefrom. This task includes an examination of the capacity of all means of internal transport. The needs of the London area will be borne in mind. The object is to have adequate plans in readiness for any emergency.

### Government Maintenance of Trunk Roads

An important announcement to the effect that the maintenance and improvement of trunk roads is to be taken over by the Ministry of Transport was made in the House of Commons on July 6.

Mr. Attlee (by private notice) asked the Minister of Transport whether he had any proposals to make for securing the improvement of roads principally used for through traffic.

Mr. Hore-Belisha.—Yes, sir. For some time the Government has had under review the difficulties in securing more uniform standards to accord with modern requirements on the main through traffic routes, and has reached the conclusion that the most satisfactory solution is to transfer from the county councils to the Minister of Transport, as highway authority, full responsibility for the maintenance and improvement of some 4,500 miles of the more important routes used largely by through traffic and usually described as trunk roads. It is the Government's intention to lay before Parliament in the autumn a Bill to effect this transfer as from the beginning of next financial year. I am communicating at once with the associations of local authorities in Great Britain which are concerned, and am inviting their co-operation and assistance in regard to the administrative features of the scheme. The proposals do not apply to any roads in the metropolitan and county boroughs in England and Wales, or the large burghs in Scotland. The Government proposes that the financial arrangements which arise out of the transfer of administrative responsibility for trunk roads should be discussed with representatives of local authorities in connection with the revision of the general Exchequer contribution under the Local Government Acts.

### Railway Carriage Doors

Mr. Day asked the Minister of Transport whether his attention had been called to the fact that certain trains when drawing out of stations or approaching platforms ran with the doors open, which might cause serious accidents to the public; and would he call the attention of the railway companies to the increasing danger of accidents so that further measures might be considered to safeguard the travelling public.

Mr. Hore-Belisha.—I have been in communication with the companies in this matter, but I am not aware that there is an increase in accidents caused by passengers on platforms being struck by open carriage doors. The hon. member is no doubt aware that the companies' byelaws provide for a penalty for the offence of opening a carriage door while the train is in motion.

# PARLIAMENTARY NOTES

### L.N.E.R. (General Powers) Bill

This Bill came on Friday (July 3) before a Select Committee of the House of Lords, presided over by Lord Milne. It includes provisions authorising the railway company to sell its Tyne Dock to the Tyne Improvement Commissioners for £600,000. The only matter in dispute related to the protection which was to be afforded to dock employees of the railway company who would be affected by the transfer. At present a staff of about 300 men is employed about the dock. The commissioners expected to be able to take over some 200 men from the railway company, which would probably have no difficulty in absorbing the remainder, but there is the possibility that the commissioners might not be able to maintain the same rates of pay. A clause was inserted in the Bill to the effect that a man who was dismissed by reason of the transfer would be compensated, and that those transferred to the Commissioners would in the event of a reduction in pay have their wages made up to the present rates by the railway company and would still be entitled to the privileges they had enjoyed as railwaymen. This protection was, however, to apply only to men who were in the grades covered by agreements as to wages and conditions of service, and who had been in the service of the company for five years. The R.C.A. and the N.U.R. asked that compensation be paid to all men who might be disturbed by the transfer.

Sir Ralph Wedgwood, Chief General Manager, L.N.E.R., and Mr. Albert Blacklock, Secretary to the Tyne Improvement Commissioners, gave evidence for the promoters. Mr. A. G. Walkden, M.P., lately General Secretary of the Railway Clerks' Association, gave evidence on Monday in support of the amendments asked for by the two railway unions. Sir Ralph Wedgwood was recalled, and said that the company felt that after five years' service a man had a claim upon it, that being a reasonable period in which a man could be trained. The longer a man stayed in the company's service the greater would be his difficulty in finding employment elsewhere.

The committee allowed the Bill to proceed with the protective provisions proposed by the promoters.

### London Passenger Transport Bill

This Bill was considered on Monday of this week (July 6) by a Select Committee of the House of Lords, over which Lord O'Hagan presided. The only part opposed was that relating to the extension of the Central London Railway from Liverpool Street underground to Stratford, where the line will come to the surface to connect with the L.N.E.R., thence in tube to a point near Leyton, where it will rise to the surface and connect with the L.N.E.R. lines, which will be used as far as Leytonstone station, whence there will be another tube line rising to the surface at Newbury Park station, Ilford, to connect with the L.N.E.R. The scheme also involves the electrification of the L.N.E.R. between Fenchurch Street and Stratford and between Leyton and Leytonstone, and the closing of certain level crossings. The opposition to the scheme came from certain property owners at Newbury Park, who objected to the new tube going under their houses and suggested the possibility of an alternative route.

Mr. Frank Pick, Vice Chairman of the London Passenger Transport Board, gave evidence in support of the scheme, and anticipated that Newbury Park would become a traffic centre like Morden.

The committee allowed the Bill to proceed.

# High Speed on the L.N.E.R.

(*See editorial note on page* 39)

A remarkable run was made on the inaugural trip of the L.N.E.R. Scarborough Flyer on Monday last. For this comparatively early date in the season, the number of passengers travelling was exceptionally large, with the result that the departure from King's Cross was 3 min. late, and an additional source of delay was a stoppage of the train for examination at Welwyn Garden City, the signalmen at Hatfield having noticed that one of the carriage headboards appeared to have been insecurely fixed. The train therefore passed Hitchin some 10½ min. behind time. Nevertheless, although the allowance for the 188·2 miles from King's Cross to York is only 180 min., the performance was such that all the arrears had been regained on passing Doncaster, and York was reached 5 min. early. The times and speeds are fully set out in the accompanying table, from which it will be seen that the time of 129 min. 28 sec. from Hitchin to York was an actual gain of 15½ min. on schedule, or a net gain of 16 min., for there was a slight signal delay, costing ½-min., at Fletton. More remarkable, however, was the Hitchin to Selby time of 115 min. 15 sec., or 114¾ min. net, for the 142·5 miles, with its average throughout of 74·5 m.p.h.—almost identical with the 114½ min. allowed the Silver Jubilee over the same distance—accomplished by one of the earlier Pacifics, with only 180-lb. pressure and without streamlining, and, furthermore, with an eleven-coach train taring 371 tons as compared with the 220-ton seven-coach set of the Silver Jubilee. A speed of 90 m.p.h. was reached at Three Counties and at two points between Grantham and Newark, and other exceptional features were the minimum speeds of 65½ m.p.h. at milepost 62 (up 3 miles at 1 in 200), 60 before Corby (up 4½ miles at 1 in 200), 57½ at Stoke (up 3 miles at 1 in 178), 64 at Markham Summit, and 71 up the short 1 in 198 to Piper's Wood. From Stevenage to Holme the 40·6 miles were run at an average of 80·4 m.p.h., and from Grantham to Doncaster, 50·5 miles, at an average of 79·4 m.p.h., so that an average of 80 was maintained over at least 90 miles—roughly one-half—of the entire journey. The extraordinary time of 53 min. 9 sec. over the 68·9 miles from Grantham to Selby cut 3 min. 21 sec. below the Silver Jubilee schedule, and nearly 9 min. below that of the Scarborough Flyer. The driver was Huddington, of Doncaster shed.

The first run of the 1.20 p.m. from King's Cross to Edinburgh on its new 7 hr. 25 min. timing was also completely successful. Out of London the fifteen-coach train tared exactly 500 tons, and with passengers and luggage weighed 530 tons; the engine was No. 4472, *Flying Scotsman*, driven by Sparshatt. Notwithstanding the load, Finsbury Park was cleared in 6 min. 10 sec., Hatfield in 24 min. 8 sec., and Hitchin in 37 min. 26 sec.; after this, with no higher speed than 83½ m.p.h. at Three Counties, Peterborough, 76·4 miles, was passed in 75 min. 34 sec. from the start, 4½ min. early, and with easy running up to Stoke, Grantham was reached in 110 min. 49 sec., 3¼ min. early. From Grantham another very fast start was made, whereby Retford, 33·1 miles, was passed in 32 min. 23 sec., and Doncaster, 50·5 miles, in 48 min. 31 sec., again 4½ min. early; Selby, 68·9 miles, was cleared in 68 min. 47 sec., and but for a signal stop outside York, the 82·7 miles would have been completed in 87¾ min. instead of the 90 min. allowed: actually York was reached in 89 min. 50 sec. From York for the third time in succession "even time" was bettered from the start, as along the level and gradually rising gradients throughout to Eryholme speed ranged between 66 and 71½ m.p.h., so that Thirsk, 22·2 miles, was passed in 23 min. 13 sec., Northallerton, 30·0 miles, in 30 min. 4 sec., and Croft Spa, 41·6 miles, in 40 min. 22 sec.; and Darlington, 44·1 miles, would have been reached in 44 min., or slightly over (booked 48 min.), but for a severe signal check outside that station, which made the actual time 46 min. 38 sec. From Darlington to Newcastle the 36 miles were run easily, notwithstanding the careful observance of two severe pitfall slowings, in 43 min. 55 sec. The allowance is 47 min., so that the train was 3 min. early here; the net gain to the locomotive, with this 530-ton train, therefore totalled 12½ min. from King's Cross to Newcastle.

Although the 130-min. schedule over the remaining 124·4 miles to Edinburgh is considerably faster than anything previously attempted in ordinary service, time-keeping with the load reduced to ten vehicles (339 tons empty and 350 tons loaded) proved a simple matter for Pacific No. 2500, *Windsor Lad*. Morpeth, 16·6 miles, was passed in 20 min. 28 sec.; and the 18·0 miles to Alnmouth occupied 17 min. 27 sec., with a maximum of 74 m.p.h. The next 32·3 miles from Alnmouth to Berwick took 31 min. 50 sec., with a minimum of 54 m.p.h. up the 1 in 170 of Longhoughton bank, and with 76½ m.p.h. past Christon Bank, followed by easy running, and a signal check at Tweedmouth. Berwick, 66·9 miles from the restart at Newcastle, was thus passed in 69¾ min. Up the rising grades to Burnmouth the train accelerated to 55½ m.p.h., and touching 71½ before Reston, mounted the long 1 in 200 to Grantshouse at a minimum of 57½ m.p.h. Afterwards 80½ m.p.h. was reached in the descent of Cockburnspath bank, so that the 28·4 miles from Berwick over Grantshouse to Dunbar were run in the fast time of 27 min. 22 sec., and with leisurely running thereafter Edinburgh was reached in 129 min. 48 sec., or 129 min. net, dead on time at 8.45 p.m.

Hauled by Pacific No. 2508, *Brown Jack*, the 7¼-hr. schedule of the non-stop Flying Scotsman was, by comparison, an easy task with an eleven-coach train, and Edinburgh was reached 2½ min. early. It is noteworthy that the net running times of the 1.20 p.m. down on the same day, with four coaches more to Newcastle and one less from there to Edinburgh, and with no allowance for stopping and starting at Grantham, York, Darlington, and Newcastle, add up to 6 hr. 55½ min., the equivalent of less than 6¾ hr. net with non-stop running. The times and speeds of the latter run were recorded by Mr. R. E. Charlewood, and those on the 1.20 p.m. from King's Cross by Mr. Cecil J. Allen, M.Inst.T.

L.N.E.R., Scarborough Flyer—July 6
Engine: 4-6-2 No. 4473, *Solario*.
Driver: Huddington, Doncaster.
Load: 11 cars, 371 tons tare, 395 tons gross.

| Distance miles | | Schedule min. | Actual min. | Actual sec. | Speeds min. |
|---|---|---|---|---|---|
| 0·0 | KING'S CROSS | 0 | 0 | 00 | — |
| 2·6 | Finsbury Park ... | — | 6 | 16 | — |
| 12·7 | Potter's Bar ... | — | 17 | 37 | — |
| 17·7 | HATFIELD ... | 22 | 21 | 55 | 77 |
| | | | sig. stop | | |
| 23·5 | *Woolmer Green* ... | — | 35 | 20 | 51½ |
| 28·6 | Stevenage ... | — | 40 | 04 | 72 |
| 31·9 | HITCHIN ... | 35 | 42 | 38 | 80½ |
| 37·0 | Arlesey ... ... | — | 46 | 04 | 91 |
| 44·1 | Sandy ... ... | — | 51 | 02 | 85½ |
| 51·7 | St. Neot's ... | — | 56 | 41 | 76 |
| 58·9 | HUNTINGDON | 56 | 62 | 07 | 84†† |
| 62·0 | *Milepost* 62 ... | — | 64 | 49 | 65½ |
| 69·4 | Holme ... ... | — | 70 | 30 | 83½ |
| | | | sigs. | | |
| 75·0 | *Fletton Junction* | — | 75 | 21 | — |
| 76·4 | PETER-BOROUGH | 73 | 77 | 23 | 26* |
| 79·5 | *Werrington Junc.* | — | 81 | 27 | 60 |
| 88·6 | Essendine ... | — | 89 | 36 | 68 |
| 97·1 | Corby ... ... | — | 97 | 30 | 60† |
| 100·1 | *Stoke Summit* ... | — | 100 | 27 | 57½ |
| 105·5 | GRANTHAM ... | 102 | 104 | 44 | 81½ |
| 109·7 | Barkston ... | — | 107 | 49 | 90 |
| 120·1 | NEWARK ... | 114 | 114 | 56 | 85† |
| 126·4 | Carlton ... ... | — | 119 | 33 | 82 |
| 133·7 | *Markham Summit* | — | 126 | 30 | 64 |
| 138·6 | RETFORD ... | 132 | 129 | 40 | 84§ |
| 143·9 | Ranskill ... ... | — | 133 | 31 | 81½ |
| 147·7 | Bawtry ... ... | — | 136 | 19 | — |
| 149·5 | *Piper's Wood Summit* ... ... | — | 137 | 48 | 71 |
| 156·0 | DONCASTER ... | 147 | 142 | 55 | 83½¶ |
| 160·2 | *Shaftholme Junc.* | — | 146 | 20 | — |
| 166·0 | Balne ... ... | — | 150 | 51 | 76 |
| 169·8 | Temple Hirst ... | — | 153 | 48 | — |
| 174·4 | SELBY ... ... | 164 | 157 | 53 | 34* |
| 178·5 | Riccall ... ... | — | 162 | 31 | 62 |
| 184·0 | Naburn ... ... | — | 167 | 14 | 72 |
| 186·2 | *Chaloner's Whin Junc.* ... ... | — | 169 | 08 | — |
| 188·2 | YORK ... ... | 180 | 172 | 06 | — |

* Service slack. †At top of 1 in 200. ‡Reduced to 78 for Muskham troughs.
§ Maximum before Retford.
¶ Maximum at mile-post 53; reduced to 67 for station.
†† Maximum before Offord.
NET TIME, 162½ minutes.
NET AVERAGE SPEED, 69·5 m.p.h. start-to-stop.

# NOTES AND NEWS

**International Timetable Conference.**—This year the annual International Timetable Conference is to be held at Montreux from Monday, October 12, to Saturday, October 17.

**Moorgate Station, London Transport.**—At Moorgate station, where extensive reconstruction works are in progress, the first of the new public facilities has been brought into service, namely, the two escalators (one up and one down) between the Northern City Line and the Morden-Edgware Line; these began work on June 19.

**New York Rapid Transit.**—Following the announcement in our issue of June 26 (page 1224) that a concrete plan for the unification of the New York City traction undertakings had been published, it is reported that Mr. Berle, the City official in charge of the unification arrangements, has stated that, according to present plans, the purchase of the rapid transit lines will be completed by May of next year.

**Retired Railway Officers' Society.**—The annual summer outing, in which a party of over 100 participated, took place on June 30 at Southampton on the invitation of the Southern Railway Company, when Lt.-Col. G. S. Szlumper acted as host, and a tour of the docks was made first by bus and then by the ss. *Isle of Guernsey*. The *Queen Mary* was inspected and the party returned in the evening by the Bournemouth Belle.

**G.W.R. Bridge Reconstruction.**—The Great Western Railway announces that the following bridges are to be reconstructed: the road bridge over the main Paddington-Penzance line near Burngullow; and the road bridge over the main South Wales line near Llanelly. Repairs are also to be carried out to the Gamlyn Viaduct near Aberdare, one of the few remaining timber viaducts on the G.W.R. system.

**Northern Ireland Pooling Scheme.**—The Minister of Home Affairs for Northern Ireland has by an Order dated June 18, directed that the period within which the Joint Committee established under Section 14 of the Road and Railway Transport Act (Northern Ireland), 1935, shall prepare and submit to the Northern Ireland Transport Board and to the railway companies concerned the scheme for pooling receipts shall be further extended to January 15, 1937.

**Agreed Charges.**—Sixty-six more applications for the approval of agreed charges have been lodged with the Railway Rates Tribunal, as will be seen from the legal notice published on page 74. These applications may be inspected at the office of the tribunal, Bush House, Aldwych, London, W.C.2. A copy of each application (1s. post free) may be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, S.W.1. Notices of objection must be filed with the Registrar of the Tribunal and a copy of each objection sent to Mr. Cole Deacon on or before July 31.

**Polish Railway Accident.**—A Warsaw-Posen express was derailed near Posen on July 2. It is reported that 10 persons were killed.

**Institution of Electrical Engineers Conversazione.**—The annual conversazione of the Institution of Electrical Engineers was held at the Natural History Museum, South Kensington, last Thursday, July 2. Guests were received by the President, Mr. J. M. Kennedy, O.B.E., and Mrs. Kennedy. A concert and other musical entertainments were held in the course of the evening.

**Nitrate Railways Concession.**—The Nitrate Railways Company announces that advice has now been received from the company's representative in Chile that the Chilean Government will not grant the company a renewal of the Iquique-La Noria concession which expires on July 26. Negotiations are however continuing with a view to some other arrangements being made for the future operation of the railway, and so soon as anything definite thereon can be announced shareholders will be advised and other public intimation made.

**Taunton-Minehead Branch Improvements, G.W.R.**—The first of the Great Western Railway Company's £5,500,000 schemes of improvements, the doubling of the 2¾ miles of line between Norton Fitzwarren and Bishop's Lydeard on the Minehead branch, has just been completed. The work has necessitated the extension of 12 culverts, a river bridge and two overbridges; the removal of 20,000 cu. yd. of excavation and the use of 8,000 cu. yd. of ballast. This is the third big scheme of improvements to be carried out within the last year or so along the 22½-mile Taunton-Minehead branch, whereby speed restrictions have been raised and better services provided.

**Central Argentine Railway 10-Year Notes.**—The scheme of arrangement between the Central Argentine Railway Limited and holders of its 6 per cent. (originally 5 per cent.) notes to bearer was sanctioned on June 15 by the Court. Holders of the notes, as will be seen from the official notice on page 73, are required to produce their notes at the office of the company, 3a, Coleman Street, E.C.2, on and from July 20, in order that a memorandum of the scheme may be placed thereon, and additional coupons for interest for the ten half-yearly instalments of interest ending July 1, 1941, may be annexed thereto. By the scheme the date of repayment of the notes is extended to July 1, 1941; the rate of interest as from July 1, 1936, is reduced from 6 per cent. to 5½ per cent.; the company has power to repay the notes at any time before July 1, 1941, on three months' notice; and noteholders have the right to exchange into 5 per cent. redeemable debenture stock 1967/87 at the rate of £110 stock for every £100 note.

**New L.M.S.R. Motor Vessel for Lake Windermere.**—The new L.M.S.R. motor vessel *Teal*, which was recently conveyed in sections by rail from Barrow-in-Furness and afterwards assembled along the shores of Lake Side, was launched on Saturday last, July 4. The vessels has been designed to provide the maximum amount of deck space for passengers, and is 135 ft. long, with a breadth of 25 ft. The L.M.S.R. fleet on Lake Windermere now consists of five vessels.

**Trunk Road Nationalisation.**—An important change in highway administration and policy is represented by a statement made by the Minister of Transport in the House of Commons on Monday that the Government proposes to promote legislation to transfer some 4,500 miles of trunk roads to the Minister of Transport. The statement is set out in our Parliamentary notes on page 67. Subject to the timetable for the passage of the necessary legislation being adhered to, it is proposed that the transfer should take effect from April 1, 1937, in England and Wales, and from May 16, 1937, in Scotland. The reason for the different dates is that they correspond with the beginning of the respective financial years.

**A Week's Travel Throughout Italy for 22s.**—A new decree just published abolishes the reduction made last year of from 30 to 50 per cent. on the price of normal free circulation tickets on the Italian railways to people living abroad, and institutes in its place a single type of ticket for the entire system at the following remarkable prices: with six days' validity, first class 240 lire, second class 170 lire, and third class 100 lire; with 15 days' validity, first class 530 lire, second class 360 lire, and third class 210 lire; with 30 days' validity, first class 900 lire, second class 620, and third class 360 lire. The special prices and other travelling facilities granted to foreigners or Italians living abroad or in the Italian colonies are prolonged indefinitely. The reduction of 70 per cent. on first class travel authorised under certain conditions by a decree last September is now cancelled.

**San Francisco Underground.**—An electric subway proposal has been drawn up to cope with the increased traffic and its change of direction which will occur when the Oakland Bay bridge is brought into use next year, and the decision of the municipal authorities is to be made within the next few weeks. The project is for three routes totalling 7½ miles of double track, and the estimated cost, including wayleaves, is $52,700,000. At the moment it is proposed that

traffic should be operated by high speed trains of the municipality, but eventually the system will connect with the interurban electric lines of the Key Route and the Southern Pacific. Both these companies will run trains over the bridge on the same tracks, but as the key is operated at 600 volts d.c. and the Southern Pacific at 1,200 volts, two contact wires are being erected over each track.

**Road Accidents.**—The Ministry of Transport return for the week ended July 4 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year :—

| | Killed, including deaths resulting from previous accidents | | Injured | |
|---|---|---|---|---|
| England ... | 113 | (101) | 4,423 | (4,420) |
| Wales ... ... | 10 | (5) | 212 | (193) |
| Scotland ... | 14 | (13) | 457 | (496) |
| | 137 | (119) | 5,092 | (5,109) |

The total fatalities for the previous week were 126, compared with 111 for the corresponding period of last year.

**New London Trolleybus Service.**—On Sunday last, July 5, the London Passenger Transport Board opened a new trolleybus service between Hammersmith and Edgware, a total distance of 12¾ miles. The new section, between Acton and Edgware, is 10 miles long. For a few weeks, until the work of converting other routes in this area has been completed, trams will continue to run as well as trolleybuses. The Acton to Edgware section is the first instalment to be completed of the London Transport scheme to replace trams by trolleybuses on 150 miles of route in the north of London.

**Proposed Gauge Conversion of West Clare Railway.**—In reply to a recent question by Mr. P. Burke in the Dail, Mr. Lemass, Minister for Industry and Commerce, Irish Free State, said that the economic requirements of County Clare did not depend primarily on the expansion of the West Clare railway to broad gauge. In the circumstances, the substantial expenditure involved in the expansion could not be justified. He added that the great development in travel in recent years had been on the roads. We recorded the proposals, which emanated locally, on page 874 of our issue of May 1, and the subsequent developments on page 927 of May 8.

**The C.P.R. Transcontinental Jubilee.**—The jubilee train of the C.P.R., celebrating the fiftieth anniversary of the first transcontinental train, arrived in Vancouver on Thursday of last week. The passengers, including 11 British journalists, were welcomed by thousands of people, headed by Mr. G. G. McGeer, the Mayor, and Mr. R. B. Bennett, the Leader of the Opposition, and former Prime Minister of Canada. Afterwards, the journalists were guests of honour at the laying of the foundation-stone of the new City Hall. On the following day, July 3, the arrival of the original train was reproduced at Port Moody, 12 miles from Vancouver, at the head of the Burrard Inlet. An ancient locomotive was driven into Port Moody station by the original driver, Mr. W. H. (Billy) Evans, and the train of old carriages was in charge of the original guard, Mr. P. A. Barnhart. Many of the participants in the pageant wore clothes preserved from the time when their parents saw the original transcontinental train arrive. Although it has been freely stated that the same locomotive was used as in 1886, we understand that the original engine has been scrapped, and that another of similar type was fitted up for the jubilee.

**New Trans-London Facility for Northern Travellers.**—The L.M.S.R., in conjunction with the Southern Railway, has arranged for passengers travelling from certain stations in the north to the south via London, to reserve their seats on Southern Railway trains on payment at the L.M.S.R. starting point of the reservation fee of 1s. a seat. The L.M.S.R. stations at which these facilities are available include Bedford (Midland Road), Birmingham (New Street), Bradford (Forster Square), Burton, Coventry, Derby, Kettering, Leeds (Wellington), Leicester, Liverpool (Lime Street), Loughborough, Luton, Manchester (London Road), Market Harborough, Northampton, Nottingham, Nuneaton, Rugby, Sheffield, Southport (Chapel Street), Wellingborough, and Wolverhampton. This new arrangement is to be the subject of six months' experiment, following which a decision will be made as to whether or not it is to become a permanent feature.

**Further L.P.T.B. Interchangeability of Tickets.**—As from July 1, the return halves of ordinary tickets issued from Ealing Broadway to the following stations will be available for the return journey by either the District Line or the Central London Line : Bow Road to Mark Lane inclusive (District) Covent Garden to Cockfosters inclusive and Aldwych (Piccadilly) ; Regents Park to Elephant and Castle (Bakerloo) ; Edgware and Highgate to Morden via Charing Cross (Morden-Edgware) ; and Marble Arch to Liverpool Street (Central London). Similar facilities will be available for holders of single and return tickets issued from these stations to Ealing Broadway via District or Central London Lines.

## Permanent Way Institution Summer Convention

(*See illustration on page* 60)

The annual summer convention of the Permanent Way Institution, which was attended by some 150 members and friends, this year had Plymouth as its centre. The proceedings opened at the Guildhall on Saturday afternoon, July 4, with the annual general meeting, at which the President, Mr. W. K. Wallace, Chief Engineer, L.M.S.R., occupied the chair. A satisfactory financial position was reported, and awards for 1935 papers were presented to Mr. W. H. Weston, G.W.R. (silver medal), Mr. H. Windmill, L.P.T.B. (silver medal), Mr. H. Williams, S.R. (bronze medal), and Mr. J. M. P. Pannell (book prize). After the meeting the members were accorded a civic reception by the Lord Mayor of Plymouth (Councillor H. M. Medland), who afterwards entertained them to tea, while Dr. Harold Lake rendered music on the Guildhall organ. The Lord Mayor, in welcoming the members, mentioned that a railway in Plymouth was first undertaken in 1819, when it was found that the city was crowded with prisoners of war and accommodation had to be made at Princetown.

In the evening Mr. Wallace presided over the annual summer dinner at the Royal Hotel. Mr. E. Lake, Divisional Engineer, G.W.R., Plymouth, and Chairman of the Exeter and West of England Section of the Permanent Way Institution, proposed the toast of "The City of Plymouth," and spoke of the historical associations of the city and of the kindness of the officials of the present Corporation in assisting to make the convention a success. The Lord Mayor, in reply, referred to the excellence of the services provided for the travelling public by the railways, and of the remarkable safety of railway travel.

Mr. Colin Campbell (Town Clerk), proposing the toast of "The Institution," referred to the wide scope of its membership, embracing not only the British Isles but many countries abroad, and to its primary object of making its members, who were really public servants, more efficient in the discharge of their duties. He also congratulated the institution on formulating an examination scheme. He thought that railways and municipal officials had something in common, in that, being always in the public eye, both were sometimes subjected to unfair criticism, but this had to be accepted and an even temper maintained.

Mr. Wallace in response said, on the subject of road competition, that the average Englishman believed in giving the small fellow a little more than fair play. Thus it was that whilst the railways had to provide themselves with an expensive track, the road users were presented with a road free of cost; indeed, the railway companies were compelled to assist them by paying heavy rates out of which the roads were maintained. Again, railway companies were bound to publish their rates, and the road carriers had not been slow to take advantage of this fact. Mr. Wallace also referred to the heavier demands being made upon the

permanent way by increased train speeds, and thought it a compliment to the permanent way staff that such increased speeds were not being attended by increased breakages of crockery in the dining cars.

Mr. R. Carpmael, Chief Engineer, Great Western Railway, proposed the toast of "The Services," and referred to the advantages gained by the companies and the men themselves from the course of military training which so many railwaymen undertook annually. Admiral the Hon. Sir Reginald Plunkett-Ernle-Erle-Drax responded. The toast of "The Guests" was proposed by Mr. H. A. Alexander, who made special mention of the honour paid to the institution by the attendance of the Lord Mayor. The Rev. Dr. T. Wilkinson Riddle replied on behalf of the guests.

On Sunday a visit was paid to the Royal Albert Bridge at Saltash, and there was a river trip to Calstock and Weir Head. On Monday members and friends were conveyed by G.W.R. tender for an all-day trip to Fowey, where, after an inspection of the Great Western's china clay loading arrangements, there was an exciting but enjoyable golf competition in a thick mist on the precipitous local course. At the conclusion of the trip Mr. Tustain showed his film of last year's Glasgow convention. On Tuesday there was a coach trip to Moretonhampstead, and Wednesday was marked by an excursion by special train provided by the Great Western Railway to Penzance. From there the party was taken by motor coaches to Land's End and back to Tregenna Castle Hotel at St. Ives, where it was entertained by the G.W.R. to tea. After a visit to H.M. Dockyard at Devonport on Thursday morning, motor coaches conveyed the party to Burrator and Lee Moor, where the largest china clay pit in the county was inspected by permission of the English China Clays Limited.

## British and Irish Traffic Returns

| GREAT BRITAIN | Totals for 27th Week | | | Totals to Date | | |
|---|---|---|---|---|---|---|
| | 1936 | 1935 | Inc. or Dec. | 1936 | 1935 | Inc. or Dec. |
| | £ | £ | £ | £ | £ | £ |
| L.M.S.R. (6,917 mls.) | | | | | | |
| Passenger-train traffic | 647,000 | 568,000 | + 79,000 | 12,026,000 | 11,929,000 | + 97,000 |
| Merchandise, &c. | 485,000 | 450,000 | + 35,000 | 12,759,000 | 12,050,000 | + 709,000 |
| Coal and coke | 202,000 | 197,000 | + 5,000 | 6,610,000 | 6,360,000 | + 250,000 |
| Goods-train traffic | 687,000 | 647,000 | + 40,000 | 19,369,000 | 18,410,000 | + 959,000 |
| Total receipts | 1,334,000 | 1,215,000 | + 119,000 | 31,395,000 | 30,339,000 | +1,056,000 |
| L.N.E.R. (6,332 mls.) | | | | | | |
| Passenger-train traffic | 395,000 | 379,000 | + 16,000 | 7,809,000 | 7,781,000 | + 28,000 |
| Merchandise, &c. | 322,000 | 283,000 | + 39,000 | 8,656,000 | 8,345,000 | + 311,000 |
| Coal and coke | 198,000 | 193,000 | + 5,000 | 6,312,000 | 6,057,000 | + 255,000 |
| Goods-train traffic | 520,000 | 476,000 | + 44,000 | 14,968,000 | 14,402,000 | + 566,000 |
| Total receipts | 915,000 | 855,000 | + 60,000 | 22,777,000 | 22,183,000 | + 594,000 |
| G.W.R. (3,746½ mls.) | | | | | | |
| Passenger-train traffic | 268,000 | 253,000 | + 15,000 | 4,988,000 | 4,966,000 | + 22,000 |
| Merchandise, &c. | 196,000 | 194,000 | + 2,000 | 5,052,000 | 4,848,000 | + 204,000 |
| Coal and coke | 87,000 | 92,000 | − 5,000 | 2,738,000 | 2,689,000 | + 49,000 |
| Goods-train traffic | 283,000 | 286,000 | − 3,000 | 7,790,000 | 7,537,000 | + 253,000 |
| Total receipts | 551,000 | 539,000 | + 12,000 | 12,778,000 | 12,503,000 | + 275,000 |
| S.R. (2,154 mls.) | | | | | | |
| Passenger-train traffic | 368,000 | 357,000 | + 11,000 | 7,513,000 | 7,467,000 | + 46,000 |
| Merchandise, &c. | 61,500 | 55,000 | + 6,500 | 1,648,000 | 1,637,500 | + 10,500 |
| Coal and coke | 24,500 | 18,000 | + 6,500 | 862,000 | 809,500 | + 52,500 |
| Goods-train traffic | 86,000 | 73,000 | + 13,000 | 2,510,000 | 2,447,000 | + 63,000 |
| Total receipts | 454,000 | 430,000 | + 24,000 | 10,023,000 | 9,914,000 | + 109,000 |
| Liverpool Overhead (6½ mls.) | 1,334 | 1,408 | − 74 | 31,131 | 31,018 | + 113 |
| Mersey (4½ mls.) | 3,980 | 3,907 | + 73 | 109,066 | 107,940 | + 1,126 |
| *London Passenger Transport Board | 575,800 | 566,100 | + 9,700 | 575,800 | 566,100 | + 9,700 |
| IRELAND | | | | | | |
| Belfast & C.D. pass. (80 mls.) | 4,536 | 4,050 | + 486 | 58,132 | 58,271 | − 139 |
| ,, ,, goods | 665 | 516 | + 149 | 14,873 | 13,345 | + 1,528 |
| ,, ,, total | 5,201 | 4,566 | + 635 | 73,005 | 71,616 | + 1,389 |
| †Great Northern pass. (543 mls.) | 15,450 | 15,150 | + 300 | 238,200 | 231,450 | + 6,750 |
| ,, ,, goods | 9,750 | 8,800 | + 950 | 251,900 | 239,900 | + 12,000 |
| ,, ,, total | 25,200 | 23,950 | + 1,250 | 490,100 | 471,350 | + 18,750 |
| †Great Southern pass. (2,076 mls.) | 47,953 | 45,279 | + 2,674 | 817,322 | 802,377 | + 14,945 |
| ,, ,, goods | 37,221 | 35,878 | + 1,343 | 1,062,601 | 1,005,832 | + 56,769 |
| ,, ,, total | 85,174 | 81,157 | + 4,017 | 1,879,923 | 1,808,209 | + 71,714 |

* 1st week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes
† 26th week

## British and Irish Railways Stocks and Shares

| Stocks | Highest 1935 | Lowest 1935 | Prices July 8, 1936 | Prices Rise/Fall |
|---|---|---|---|---|
| G.W.R. | | | | |
| Cons. Ord. | 55½ | 44½ | 47½ | +½ |
| 5% Con. Prefce. | 124 | 108 | 118 | — |
| 5% Red.Pref.(1950) | 117 | 106¾ | 111½ | — |
| 4% Deb. | 118½ | 108 | 111½ | — |
| 4¼% Deb. | 122 | 110 | 116½ | — |
| 4½% Deb. | 129½ | 118 | 122½ | − |
| 5% Deb. | 140¼ | 130 | 136½ | — |
| 2½% Deb. | 82¼ | 68½ | 76 | — |
| 5% Rt. Charge | 137 | 128 | 132 | +½ |
| 5% Cons. Guar. | 136¾ | 120½ | 132 | +1 |
| L.M.S.R. | | | | |
| Ord. | 25 5/16 | 16 | 23 | +½ |
| 4% Prefce. (1923) | 58¼ | 43½ | 71½ | +2½ |
| 4% Prefce. | 87½ | 73½ | 86 | +1½ |
| 5% Red.Pref.(1955) | 107 | 97¾ | 107½ | — |
| 4% Deb. | 110¼ | 99½ | 106½ | — |
| 5% Red.Deb.(1952) | 119 11/16 | 111 5/16 | 116½ | — |
| 4% Guar. | 105⅝ | 95½ | 103 | — |
| L.N.E.R. | | | | |
| 5% Pref. Ord. | 15⅞ | 8¼ | 10 | — |
| Def. Ord. | 7 9/16 | 4¾ | 5 | — |
| 4% First Prefce. | 74¾ | 48 | 67 | +½ |
| 4% Second Prefce. | 31¾ | 16¼ | 24½ | — |
| 5% Red.Pref.(1955) | 92¼ | 71 | 92½ | — |
| 4% First Guar. | 103 11/16 | 93 | 100 | — |
| 4% Second Guar. | 98¾ | 82½ | 94 | — |
| 3% Deb. | 86 | 75 | 82 | — |
| 4% Deb. | 109¼ | 98½ | 105½ | — |
| 5% Red.Deb.(1947) | 118¼ | 106½ | 111½ | — |
| 4½% Sinking Fund Red. Deb. | 112½ | 108 | 109 | — |
| SOUTHERN | | | | |
| Pref. Ord. | 87½ | 69⅜ | 91 | — |
| Def. Ord. | 25 13/16 | 16¾ | 21½ | — |
| 5% Prefce. | 124 | 108¼ | 120 | — |
| 5% Red.Pref.(1964) | 117¾ | 109½ | 118½ | — |
| 5% Guar. Prefce. | 136½ | 121½ | 131½ | +1 |
| 5% Red.Guar.Pref. (1957) | 121¼ | 112½ | 119½ | — |
| 4% Deb. | 116¾ | 107 | 110 | — |
| 5% Deb. | 138 | 130¼ | 135½ | — |
| 4% Red. Deb. 1962–67 | 115 | 106½ | 111 | — |
| BELFAST & C.D. | | | | |
| Ord. | 9 | 4 | 6 | — |
| FORTH BRIDGE | | | | |
| 4% Deb. | 111¼ | 104¼ | 104½ | — |
| 4% Guar. | 109⅞ | 104 | 104½ | — |
| G. NORTHERN (IRELAND) | | | | |
| Ord. | 20 | 7 | 16½ | — |
| G. SOUTHERN (IRELAND) | | | | |
| Ord. | 57½ | 14½ | 59½ | — |
| Prefce. | 50 | 25¼ | 60 | — |
| Guar. | 88¾ | 51¼ | 85 | — |
| Deb. | 86¼ | 70 | 91½ | +1¾ |
| L.P.T.B. | | | | |
| 4½% "A" | 130 | 119¾ | 122½ | — |
| 5% "A" | 139¾ | 130 | 133½ | — |
| 4½% "T.F.A." | 113¾ | 108 | 109 | — |
| 5% "B" | 131½ | 122¾ | 128½ | +1½ |
| "C" | 109½ | 91 | 106 | +2 |
| MERSEY | | | | |
| Ord. | 23⅛ | 9¼ | 24½ | — |
| 4% Perp. Deb. | 100½ | 93½ | 99½ | — |
| 3% Perp. Deb. | 75½ | 67 | 76 | — |
| 3% Perp. Prefce. | 62 | 47¼ | 64½ | — |

# CONTRACTS AND TENDERS

### Further L.N.E.R. Wagon Order

In addition to the large orders for goods rolling stock, placed by the L.N.E.R. and announced exclusively in last week's issue of THE RAILWAY GAZETTE, the L.N.E.R. has ordered 200 more 12-ton open wagons from R. Y. Pickering & Co. Ltd.

The L.N.E.R. has placed with Burns & Lindemann Limited, Lowgate, Hull, a contract for an anti-coal breakage appliance to be installed at Grimsby Docks.

The London Passenger Transport Board has placed an order for two A.E.C. diesel railcars, to run between Chesham and Chalfont and Latimer stations, on the Metropolitan line. These railcars, the first to be put into service by the board, will be similar to those now working on the G.W.R. Further details are given on page 92 of *The Diesel Railway Traction Supplement* to this issue.

The Associated Equipment Co. Ltd. has received orders from railway-associated road transport operators as follow: London Passenger Transport Board, six Mercurys; Currie & Co. (Newcastle) Ltd., three Matadors; Pickfords Limited, four diesel-engined Matadors and four diesel-engined Mammoth Major 8's.

The Assam-Bengal Railway has accepted the combined tender of Braithwait, Burn and Jessop for the construction of the railway bridge over the Meghna River, consisting of six deck spans of 105 ft. each, and seven through spans of 331 ft. each.

Leyland Motors Limited has received orders from railway-associated road transport operators as follow: East Kent Road Co. Ltd., 25 diesel-engined Titans; East Yorkshire Motor Services Limited, seven diesel-engined Titans, and 24 diesel-engined Tigers; and Melbourne & Metropolitan Tramways, one Cub.

The Bombay, Baroda & Central India Railway Administration has placed orders to the inspection of Messrs. Rendel, Palmer & Tritton with Taylor Bros. Ltd. for 150 Sorbitic tyres for electric stock and with Carters (Merchants) Limited, on behalf of Skoda Works Limited for 124 pairs of broad-gauge wheels and axles.

The Calcutta Port Commissioners have finally decided to award the contract for the new Howrah road bridge over the Hooghly river to the Cleveland Bridge & Engineering Co. Ltd. subject to the sanction of the Bengal Government, which is to assist in financing the scheme. The tender is £1,600,000. As recorded on page 882 of THE RAILWAY GAZETTE for May 1, it was understood that the contract had been awarded to a combine of Braithwait, Burn, & Jessop. Subsequent developments, as recorded in our Overseas columns, showed, however, that the matter had not been finally decided.

### South African Rolling Stock Orders

As announced in THE RAILWAY GAZETTE last week the South African Railways Administration is placing large orders for passenger and goods rolling stock in this country and on the Continent. Contracts have now been placed for passenger rolling stock as follow:—

Metropolitan-Cammell Carriage & Wagon Co. Ltd., 18 type C25 main line coaches.
Birmingham Railway Carriage & Wagon Co. Ltd., 35 type E13 main line coaches.

Contracts, valued at £167,800, have also been placed in this country for 375 D27 type steel drop-sided bogie wagons, 200 of which are to be built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., and 175 by the Birmingham Railway Carriage & Wagon Co. Ltd.

Orders, valued at £442,000, have also been placed by the South African Railways Administration on the Continent for 500 ES5 type four-wheeled steel wagons with Orenstein & Koppel A.G. on behalf of a German group of manufacturers, and for 375 D27 type steel drop-sided bogie wagons with the Soc. Anon. La Brugeoise et Nicaise & Delcuve.

The Butterley Co. Ltd. has received an order for 200 12-ton coal wagons from Charrington, Booth Limited.

Carters (Merchants) Limited, on behalf of Skoda Works Limited has received an order from the Madras & Southern Mahratta Railway for 250 carriage and wagon axles.

Ransomes & Rapier Limited has received an order from the Chinese Government Purchasing Commission, to the inspection of Messrs. Fox & Mayo, for 30-metre turntables required for installation at Canton and Hankow running sheds of the Canton-Hankow Railway.

The Birmingham Railway Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies on behalf of the Palestine Railways for 75 four-wheeled covered goods wagons, 4 ft. 8 in. gauge, complete with wheels and axles.

The Bombay, Baroda & Central India Railway Administration has placed orders to the inspection of Messrs. Rendel, Palmer & Tritton, with S. A. Gilsoco for 10,000 chair spikes, 1,000,000 dogspikes and 66,500 fishbolts.

The Economical Boiler Washing Co. Ltd. has received an order from the Bombay, Baroda & Central India Railway Administration for a hot water locomotive boiler washing plant required for Bandra shed and to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

Harland & Wolff Limited is building a 330 b.h.p. six-wheeled diesel-hydraulic locomotive for shunting and branch line service on the Northern Counties Committee section of the L.M.S.R.

Thomas Summerson & Sons Ltd. has received an order for the construction and installation of extensive railway sidings at the new plant of Low Temperature Carbonisation Limited at Bolsover.

D. Wickham & Co. Ltd. has received an order from the Central Rio Grande do Norte Railway Administration for one petrol-driven open type inspection railcar.

J. O'Hara, Murray & Co., on behalf of Stahl Union Export Company, has received an order from the Bengal-Nagpur Railway for a quantity of pins, washers, and shacklebolts for bogie wagons.

The Hunslet Engine Co. Ltd. has received an order for one saturated locomotive boiler for MF class locomotive, for the Rohilkund & Kumaon Railway, to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

The North British Locomotive Co. Ltd. has received orders from the Bengal-Nagpur Railway for five superheated boilers for FTS class locomotives and five sets of Lambert sanding gear.

Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Bengal-Nagpur Railway for 7,000 spring hangers for bogie wagons.

The South African Railways and Harbours Administration is calling for tenders for a coal-pulverising unit complete with all equipment for firing two furnaces at the Bloemfontein workshops. Further details may be obtained upon application to the Department of Overseas Trade.

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CANADIAN PACIFIC EARNINGS.—Gross earnings of the Canadian Pacific Railway for the month of May, 1936, amounted to $11,223,000, an increase of $1,309,000 in comparison with May, 1935. In the working expenses of $9,773,000 there was an increase of $1,003,000, leaving net earnings $306,000 higher, at $1,450,000. Aggregate gross earnings for the first five months of 1936 were $51,087,000, an increase of $4,748,000, and the net earnings of $5,615,000 were higher by $957,000.

CANADIAN NATIONAL EARNINGS.—For the month of May, 1936, gross earnings of the Canadian National Railways amounted to $15,400,121, an increase of $1,354,740 in comparison with May, 1935. Operating expenses ($14,466,570) advanced by $1,075,717, leaving net earnings of $933,551, which were $279,023 higher than for May, 1935. Aggregate gross earnings from January 1 to May 31, 1936, were $70,721,663, an improvement of $4,302,122, but the net earnings for the five months were $476,647 lower, at $197,624.

# OFFICIAL NOTICES

**Bengal-Nagpur Railway Company Limited.**

THE Directors are prepared to receive Tenders for :—
14 H.S.M. CLASS BOILERS.
Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after 3rd July, 1936.
A fee of 20s. will be charged for each copy of the Specification, which is *NOT* returnable.
Tenders must be submitted not later than Noon on Friday, 17th July, 1936.
The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board
T. R WYNNE,
Managing Director.

**Central Argentine Railway Limited**

6 PER CENT. NOTES TO BEARER.

THE Scheme of Arrangement between the Central Argentine Railway Limited and the Holders of the 6 per cent. Notes to Bearer (originally 5 per cent. Ten-year Notes to Bearer) of the Company having been sanctioned by an Order of the Court on the 15th June, 1936, NOTICE IS HEREBY GIVEN that Holders of the said Notes are required to produce their Notes at the Registered Office of the Company, 3a, Coleman Street, London, E.C.2, on and from the 20th July, 1936, in order that a memorandum of the Scheme may be placed thereon, and that there may be annexed thereto additional coupons for interest for the ten half-yearly instalments of interest ending on the 1st July, 1941.
By the Scheme the date of repayment of the Notes is extended to 1st July, 1941; the rate of interest as from the 1st July, 1936, is reduced from 6 per cent. per annum to 5½ per cent. per annum, payable half-yearly on the 1st January and 1st July (the first payment at such reduced rate to be made on the 1st January, 1937); the Company has power to repay the Notes at any time before the 1st July, 1941, on three months' previous notice by advertisement; and every Noteholder has the right at any time whilst his Notes are outstanding (notwithstanding that the Company shall have given notice of its intention to repay such Notes) by notice in writing to the Company to exchange his Notes or any of them into 5 per cent. Redeemable (Non-Convertible) Debenture Stock, 1967/87, at the rate of £110 Stock for every £100 Note, such 5 per cent. Redeemable (Non-Convertible) Debenture Stock to rank in point of security and in all respects *pari passu* with all other 5 per cent. Redeemable Debenture Stock, 1967/87, of the Company for the time being outstanding and to be subject to the same provisions, conditions and regulations as relate to such Stock except that the Holders of Stock so issued by way of exchange for Notes shall not have any right to exchange such Stock for 4 per cent. Debenture Stock of the Company.
Dated this 7th day of July, 1936.

By Order of the Board,
G. COCOLLIS,
Assistant Secretary.

**Bombay, Baroda & Central India Railway Company**

NOTICE IS HEREBY GIVEN that the One Hundred and Forty-Ninth General Meeting of the Bombay, Baroda & Central India Railway Company will be held at Southern House, E.C. (formerly Cannon Street Hotel), on Wednesday, the 22nd July, at 1 o'clock precisely.
(1) To receive the Directors' report and accounts.
(2) To declare a dividend.
(3) To transact the general business of the Company.
Warrants for the guaranteed interest and dividend will be forwarded on the 22nd day of July to Stockholders registered in the Company's books on the 27th day of June, 1936.

By Order,
S. G. S. YOUNG,
Secretary.

*N.B.*—A copy of the Directors' report and accounts can be obtained by any Stockholder on application to the Secretary.
Offices : The White Mansion, 91, Petty France, Westminster, S.W.1.
6th July, 1936.

THE Proprietor of the Patent No. 191,494 for a Valve Cut-off Correction Instrument, is desirous of entering into arrangements by way of licence and otherwise on reasonable terms for the purpose of exploiting the same and ensuring its full development and practical working in this country. All communications should be addressed in the first instance to : HASELTINE, LAKE & Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2.

**The Bengal & North Western Railway Company Limited**

THE Directors are prepared to receive Tenders for the supply of :—
SIX "P" CLASS LOCOMOTIVE BOILERS
as per specification to be seen at the Company's Offices.
Tenders addressed to the undersigned, and envelope marked "Tender for Boilers," with name of firm tendering, to be lodged not later than Noon on the 24th day of July, 1936.
For each Specification a fee of 10s. will be charged, which cannot, under any circumstances, be returned.
The Directors do not bind themselves to accept the lowest or any Tender.

By Order of the Board,
W. R. IZAT,
Managing Director.

237, Gresham House,
Old Broad Street,
London, E.C.2.
7th July, 1936.

**Crown Agents for the Colonies**

COLONIAL GOVERNMENT APPOINTMENTS.

APPLICATIONS from qualified candidates are invited for the following post :—
ASSISTANT ACCOUNTANT required by the Government of Nigeria for the Railway Department for two tours of 12-18 months each. Salary £400—£15—£430—£20—£450—£30—£600 a year. Free passages and quarters and liberal leave on full salary. Candidates, aged 25-35, must be fully experienced Accountants possessing a thorough up-to-date knowledge of the Powers-Samas Mechanical Accounting Machines and methods.
Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4, Millbank, London, S.W.1, quoting M/4361.

LONDON firm specialising in supply Railway Track Tools and Appliances desires handle additional lines. Established connection railways in England and Overseas. Close touch with Continent, Far and Near East and South America.—Write Box P.312, SCRIPP'S, South Molton Street, London, W.1.

# RAILWAY AND OTHER REPORTS

**Midland Bank Limited.**—The directors announce an interim dividend for the half-year ended June 30 last at the rate of 16 per cent. per annum, less income tax, payable on July 15 next. The same rate of dividend was declared a year ago.

**Dorada Railway.**—Gross revenue of the railway for the year 1935 was £144,707, an increase of £22,047 on 1934, but in the working expenses of £92,332 there was an increase of £17,239, or 23 per cent., due to increased wages resulting from the award of the President of Colombia after the strike of 1934-35 and to the larger tonnage handled. The balance of revenue account (at $5 to the £) is £52,375, but a sum of £25,233 for difference in exchange has had to be written off against this account. The directors recommend a dividend of 3 per cent. for the year, leaving £18,130 to be carried forward, as against £28,020 brought in. Paying goods traffic was greater by 37,166 tons, or 27·84 per cent., and the receipts therefrom increased from £93,522 to £114,386. Gross earnings of the ropeway branch in 1935 were £52,835 and the working expenses £43,092, but the heavy loss in exchange on ropeway remittances owing to the purchase of a considerable quantity of wire rope for permanent way replacement converted a working profit of £9,743 into a loss.

**Bolivar Railway Co. Ltd.**—Gross receipts of the Bolivar Railway and of the Puerto Cabello & Valencia Railway (which is worked by the Bolivar Railway Company) for the year 1935 amounted to £70,176, an increase of £108 on 1934, and working expenses amounted to £65,515, a decrease of £1,029. The profit on working was £4,661. Sundry credits bring the total net income to £11,008. After allowing for debenture interest accrued not paid, for interest on loans, and for £9,000 (Puerto Cabello & Valencia Railway rent), there is a deficit for the year of £24,436. Goods tonnage increased by 8,000, and the number of passengers (113,581) was 8,156 higher than in 1934. Railcars enabled the company to retain the passenger traffic in face of motorbus competition.

**Charles Roberts & Co. Ltd.**—Net profits for the year ended March 31 show improvement from £14,558 for 1934-35 to £38,731, and are arrived at after providing £13,500 (against £6,000) for income tax. A further payment on account of preference dividend arrears was made on July 9 covering the two years to December 31 last. This involves a reduction in the balance forward from £23,419 to £15,432. The report states that in the early part of the year orders were more plentiful, but they fell away a few months later. They are now coming along in increasing volume, and at present the company is very heavily engaged for some considerable time ahead. With a view to providing for the redemption of the existing debentures and the repayment of bank loans, it has been decided to take power to issue £500,000 new 4 per cent. preference stock secured by a floating charge on the assets of the company. A contract has been entered into to sell £400,000 of this stock to the Prudential Assurance Company at 97 per cent., leaving £100,000 available for future issue.

**Greenwood & Batley Limited.**—After charging £12,000 (against £10,000) for depreciation, the net profit for the year ended March 31 last was £25,085 (against £26,794 for 1934-35). Preference dividends absorb £7,028, and the payment of 4½ per cent. (against 4 per cent.) on the ordinary shares requires £15,678, leaving £22,222 to be carried forward (against £19,843).

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# LEGAL NOTICES

*In the Court of the Railway Rates Tribunal.*

## Road and Rail Traffic Act, 1933. Agreed Charges.

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The said Applications may be inspected at the Office of the Tribunal, Bush House, Aldwych, London, W.C.2, at any time during office hours and at the following places:—

LONDON: Railway Clearing House, 123, Seymour Street, N.W.1.

BIRMINGHAM: District Goods Manager's Office, Snow Hill, Great Western Railway.

CARDIFF: Divisional Superintendent's Office, Great Western Railway.

EXETER: Western Divisional Superintendent's Office, Southern Railway.

LEEDS: District Goods Manager's Office, Wellington Street, London & North Eastern Railway.

LEICESTER: District Goods and Passenger Manager's Office, London Midland & Scottish Railway.

MANCHESTER: District Goods Manager's Office, Hunt's Bank, London Midland & Scottish Railway.

SOUTHAMPTON: Southern Divisional Superintendent's Office, Southampton Central, Southern Railway.

YORK: Goods Manager's Office, London & North Eastern Railway.

ABERDEEN: District Goods and Passenger Manager's Office, London Midland & Scottish Railway.

EDINBURGH: District Goods and Passenger Manager's Office, Waverley Station, London & North Eastern Railway.

GLASGOW: Commercial Manager's Office, Central Station, London Midland & Scottish Railway.

A copy of each Application lodged with the Tribunal can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price 1s., post free.

Notices of objection by any parties entitled to object to the approval of any of the said Agreed Charges must state concisely the grounds of objection and must be filed at the office of the Registrar, Bush House, Aldwych, London, W.C.2, on or before the 21st day of July, 1936, and a copy thereof on or before the same day served on or sent by registered post to Mr. G. Cole Deacon, at the above address. A separate Notice must be filed and served in respect of each Application.

Each Notice filed must be on foolscap size paper and must be stamped with an adhesive fee stamp for 2s. 6d. (which can be purchased at the office of the Tribunal only), if sent by post for filing each Notice must be accompanied by a Postal Order for 2s. 6d. payable to the Registrar when a stamp will be affixed at the office. A Notice by a Representative Body of Traders must contain a statement of the facts upon which such Body claims to represent a substantial number of traders interested in, or likely to be affected by the decision on, the application.

Five additional copies of each Notice must be lodged with the original at the office of the Registrar.

T. J. D. ATKINSON,
Registrar.

7th July, 1936.

| Number of Application and Date of Lodgment | Parties to Agreement | Nature of Agreed Charge |
|---|---|---|
| 1936—No. 300—June 8, 1936 | VALENTINE & SONS LTD., Westfield Works, Dundee, and the L. & N.E. and L.M. & S. Railway Cos. | Per package.<br>Calendars, Pictures (framed), Christmas Cards, Post Cards and Stationery. |
| 1936—No. 301—June 8, 1936 | T. C. SMAILES & SON, 122, Scholes, Wigan (*Registered Bacon Curer*), and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos. and L.P.T.B.<br>*This Application, by leave granted under Rule 4, relates also to an Agreed Charge with another Registered Bacon Curer in Great Britain as specified therein.* | Per Live Pig.<br>Live Pigs consigned to the Traders or their Agents. |
| 1936. No. 302—June 15, 1936 | JOHNSON BROTHERS (DYERS) LTD., Bootle Dye Works, Liverpool, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. and L.P.T.B. | Per ton.<br>(i) Dyed and Cleaned Goods.<br>(ii) Goods for Dyeing and Cleaning.<br>(iii) Returned Empties. |
| 1936. No. 303—June 19, 1936 | REUBEN MARSDEN, 212, Pall Mall, Chorley (*Registered Bacon Curer*), and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. and L.P.T.B.<br>*This Application, by leave granted under Rule 4, relates also to Agreed Charges with four other Registered Bacon Curers in Great Britain as specified therein.* | Per Live Pig.<br>Live Pigs consigned to the Traders or their Agents. |
| 1936. No. 307—July 1, 1936 | MARK WILLIAMS & SONS LTD., Standishgate, Wigan (*Registered Bacon Curer*), and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. and L.P.T.B.<br>*This Application, by leave granted under Rule 4, relates also to an Agreed Charge with another Registered Bacon Curer in Great Britain as specified therein.* | Per Live Pig.<br>Live Pigs consigned to the Traders or their Agents. |
| 1936. No. 308—July 1, 1936 | ACKLAND & PRATTEN LIMITED, Portland Works, Bristol, 2, and the G.W. and L.M. & S. Railway Cos. | Per ton.<br>Coarse Paper, Paper Bags, Stationery. |
| 1936. No. 309—July 1, 1936 | THE BRITISH GAS & TORCH CO. LTD., 10, Victoria Street, London, S.W.1, and the L. & N.E. and L.M. & S. Railway Cos. | Per cylinder of Gas.<br>Pyrogas in cylinders. |
| 1936. No. 310—July 1, 1936 | BRITISH NATIONAL DOLLS LIMITED, 4-8, Hutton Grove, Finchley, London, N.12, and the L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Dolls in cases; Empties returned to Supplirs. |
| 1936. No. 311—July 1, 1936 | COLEMAN & CO. LTD., Wincarnis Works, Norwich, and the L. & N.E. Railway Co. and the Midland and Great Northern Joint Committee. | Per ton.<br>(i) "Wincarnis"; Advertising Material.<br>(ii) Empty Bottles. |
| 1936. No. 312—July 1, 1936 | CRANBUX LIMITED, 103, Westwick Street, Norwich, and the L. & N.E. Railway Co., and the Midland and Great Northern Joint Committee. | Per ton.<br>"Odol" (Tooth Paste, Tooth Powder, Denture Powder, Solid Dentifrice and Mouth Wash); Advertising Material. |
| 1936. No. 313—July 1, 1936 | H. J. HEINZ CO. LTD., Harlesden, London, N.W.10, and the G.W. and L.M. & S. Railway Cos. | Per ton.<br>Groceries, Preserves and Provisions. |
| 1936. No. 314—July 1, 1936 | C. HERENDEEN & CO. LTD., Anson Place, Liverpool, 3, and the Cheshire Lines Committee and the G.W., L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Sausage Meal; Pepper and Spices. |
| 1936. No. 315—July 1, 1936 | S. C. JOHNSON & SON LTD., West Drayton, and the G.W. Railway Co. | Per ton.<br>Wax Polish; Wood Stains; Varnish; Brushes (floor), and Handles. |
| 1936. No. 316—July 1, 1936 | LANDIS & GYR LIMITED, Elgee Works, Victoria Road, North Acton, London, W.3, and the G.W., L.M. & S., L. & N.E. and Southern Railway Cos. | Per ton.<br>Electric Meters; Empties returned to Suppliers. |
| 1936. No. 317—July 1, 1936 | LEA & PERRINS LIMITED, Midland Road, Worcester, and the G.W. and L.M. & S. Railway Cos. | Per ton.<br>Sauces, Salad Cream, Advertising Matter, Empties returned to Suppliers. |
| 1936. No. 318—July 1, 1936 | McCLURE, YOUNG & CO. LTD., 90, Standard Road, Park Royal, London, N.W.10, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per ton.<br>Chemicals; Disinfectants; Drugs and Druggists' Sundries Edible Oils, Empties returned to Suppliers. |
| 1936. No. 319—July 1, 1936 | SICHEL ADHESIVES LIMITED, Richmond, Surrey, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per ton.<br>Gums, Glues and Pastes. |
| 1936. No. 320—July 1, 1936 | WM. TEACHER & SONS LTD., 14, St. Enoch Square, Glasgow, C.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per ton.<br>Wines and Spirits in cases; Advertising Matter. |
| 1936. No. 321—July 1, 1936 | WM. TEACHER & SONS LTD., 14, St. Enoch Square, Glasgow, C.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. and L.P.T.B. | Per ton.<br>Empties returned to the Trader. |
| 1936. No. 322—July 1, 1936 | WM. TEACHER & SONS LTD., 14, St. Enoch Square, Glasgow, C.1, and the L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Wines and Spirits in casks or cases; Advertising Matter. |
| 1936. No. 323—July 1, 1936 | WM. TEACHER & SONS LTD., 14, St. Enoch Square, Glasgow, C.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. and L.P.T.B. | Per ton.<br>Empties returned to the Trader. |
| 1936. No. 324—July 1, 1936 | GEORGE WEBB & SONS, Mentone Works, Brockton Street, Northampton, and the L.M. & S. Railway Co. | Per ton.<br>Boots and Shoes. |
| 1936. No. 325—July 1, 1936 | WOODFORD & WORMLEIGHTON LIMITED, Langton Street, Leicester, and the L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Knitted Wear. |
| 1936. No. 326—July 1, 1936 | JAMES CARTER & CO. (CARTERS TESTED SEEDS LIMITED), Raynes Park, London, S.W.20, and the Southern Railway Co. | Per ton.<br>Fertilizers; Seeds; agricultural, flower and vegetable. |
| 1936. No. 327—July 1, 1936 | THE DISTRIBUTERS AND TRANSPORTERS LIMITED (MESSRS. UNILEVER'S DISTRIBUTING ORGANISATION), Unilever House, Blackfriars, London, E.C.4, and the G.W. and Southern Railway Cos.<br>*Applicable to traffic consigned by six Associated or Subsidiary Companies.* | Per ton.<br>Candles, Soap and Soap with Articles for Advertisement. |
| 1936. No. 328—July 1, 1936 | THE DISTRIBUTERS AND TRANSPORTERS LIMITED (MESSRS. UNILEVER'S DISTRIBUTING ORGANISATION), Unilever House, Blackfriars, London, E.C.4, and the G.W. and Southern Railway Cos.<br>*Applicable to traffic consigned by three Associated or Subsidiary Companies.* | Per ton.<br>Margarine, Lard and Lard Substitutes. |

# Legal Notices—*continued*

| Number of Application and Date of Lodgment | Parties to Agreement | Nature of Agreed Charge |
|---|---|---|
| 1936. No. 329—July 1, 1936 | THE DISTRIBUTERS AND TRANSPORTERS LIMITED (MESSRS. UNILEVER'S DISTRIBUTING ORGANISATION), Unilever House, Blackfriars, London, E.C.4, and the G.W. and L.M. & S. Railway Cos.<br>*Applicable to traffic consigned by four Associated or Subsidiary Companies.* | Per ton.<br>Candles, Soap and Soap with articles for advertisement. |
| 1936. No. 330—July 1, 1936 | THE DISTRIBUTERS AND TRANSPORTERS LIMITED (MESSRS. UNILEVER'S DISTRIBUTING ORGANISATION), Unilever House, Blackfriars, London, E.C.4, and the G.W. and L.M. & S. Railway Cos.<br>*Applicable to traffic consigned by one Associated or Subsidiary Company.* | Per ton.<br>Margarine, Lard and Lard Substitutes. |
| 1936. No. 331—July 1, 1936 | THE GREAT UNIVERSAL STORES LIMITED, Devonshire Street, Ardwick, Manchester, and the Cheshire Lines Committee and the G.W., L. & N.E. and L.M. & S. Railway Cos.<br>*Applicable also to traffic consigned by five Associated or Subsidiary Companies.* | Per consignment.<br>Furniture, General Stores Wares and Advertising Matter (except when returned to Suppliers). |
| 1936. No. 332—July 1, 1936 | THE GREAT UNIVERSAL STORES LIMITED, Devonshire Street, Ardwick, Manchester, and the L.M. & S. Railway Co.<br>*Applicable also to traffic consigned by three Associated or Subsidiary Companies.* | Per consignment.<br>Furniture, General Stores Wares and Advertising Matter. |
| 1936. No. 333—July 1, 1936 | GRIFFITHS & DIGGENS LIMITED, Palace of Industry, Wembley, Middlesex, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per ton.<br>Waxed Paper. |
| 1936. No. 334—July 1, 1936 | THE HALLAMSHIRE VINEGAR CO. LTD., Farfield Road, Neepsend, Sheffield, and the L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Vinegar, Pickles and Sauces. |
| 1936. No. 335—July 1, 1936 | HARRODS LIMITED, Knightsbridge, S.W.1, and the G.W., L.M. & S., L. & N.E. and Southern Railway Cos. | Per ton.<br>Furniture (other than Household Removals) and General Stores; Empties returned to Suppliers. |
| 1936. No. 336—July 1, 1936 | JUDGE BRAND CO. LTD., 24, Eldon Square, Newcastle-on-Tyne, 1, and the L. & N.E. Railway Co. | Per ton.<br>Enamels, Varnish, Polishes, Stains, Dressings, Dyes, Paints, Colours, Turpentine and Brushes. |
| 1936. No. 337—July 1, 1936 | WILLIAM MACDONALD & SONS, Cardonald, Glasgow, S.W.2, and the L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Biscuits. |
| 1936. No. 338—July 1, 1936 | MARR, DOWNIE & CO. LTD., 48, Avenue Street, Bridgeton, Glasgow, and the L. & N.E. and L.M. & S. Railway Cos. | Per ton.<br>Stationery, Paper, Books and Stationers' Sundries. |
| 1936. No. 339—July 1, 1936 | HARRY RUDGE, Islington Works, Halesowen, and the G.W. and L.M. & S. Railway Cos. | Per ton.<br>Iron or Steel Chains, Holdfasts, Nails, Spikes, Nuts, Bolts, Rings, Wall Ties, in consignments not exceeding 2 tons each in weight; Iron or Steel Common Gate Hinges, Hooks, Wall Brackets; Boiler Sets; Empties returned to Suppliers. |
| 1936. No. 340—July 1, 1936 | THE SHREDDED WHEAT CO. LTD., Welwyn Garden City, Herts, and the L. & N.E. Railway Co. | Per package.<br>"Shredded Wheat." |
| 1936. No. 341—July 1, 1936 | W. H. SMITH & SON LTD., Strand House, London, W.C.2, and the L.M. & S. Railway Co. | Per package.<br>Books and Stationery; Newspapers and Periodicals published at regular intervals. |
| 1936. No. 342—July 1, 1936 | CLIFFORD WILLIAMS & SON LTD., Anne Road, Handsworth, Birmingham 21, and the G.W. and L.M. & S. Railway Cos. | Per ton.<br>Clothing; Empties returned to Suppliers. |
| 1936. No. 343—July 7, 1936 | T. BLANNING & SONS, Hallatrow, near Bristol, and the G.W. Railway Co. | Per ton.<br>Butter. |
| 1936. No. 344—July 1, 1936 | DYSON & HORSFALL LIMITED, Aqueduct Mills, Preston, and the L.M. & S. Railway Co. | Per package.<br>Clothing, Drapery and General Stores Wares. |
| 1936. No. 345—July 1, 1936 | FOLKES LIMITED, 9 and 10, Fell Street, Wood Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per package.<br>Gentlemen's Neckties and Shirts. |
| 1936. No. 346—July 1, 1936 | GERRISH, AMES & SIMPKINS LIMITED, Carlington Works, 129, 131 and 133, Mare Street, Hackney, London, E.8, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.<br>*Applicable also to traffic consigned by one Associated or Subsidiary Company.* | Per package.<br>Clothing and Advertising Matter. |
| 1936. No. 347—July 1, 1936 | GIBSON BROTHERS (LIVERPOOL) LTD., Kempston Street, Liverpool, 3, and the Cheshire Lines Committee and the G.W., L. & N.E., L.M. & S. and Mersey Railway Cos. | Per ton.<br>"Gibro" Table Delicacies. |
| 1936. No. 348—July 1, 1936 | M. IZBICKI LIMITED, 49–53, Poland Street, Oxford Street, London, W.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per package.<br>Clothing, Piece Goods and Advertising Matter. |
| 1936. No. 349—July 1, 1936 | ROBERT LAWSON & SONS (DYCE) LTD., Dyce, Aberdeenshire, and the L. & N.E. Railway Co. | Per ton.<br>Fresh Meat, Bacon, Cooked Meats, Sausages, Lard, Dripping and Meat Offals. |
| 1936. No. 350—July 1, 1936 | LEWIS & HYLAND, New Rents, Ashford, Kent, and the Southern Railway Co.<br>*Applicable also to traffic consigned by two Associated or Subsidiary Companies.* | Per package.<br>Boots and Shoes, Clothing, Drapery, Furniture and Carpets. |
| 1936. No. 351—July 1, 1936 | LOTUS LIMITED, Stafford, and the L. & N.E. and L.M. & S. Railway Cos. | Per package.<br>Boots and Shoes. |
| 1936. No. 352—July 1, 1936 | LOTUS LIMITED, Stafford, and the L.M. & S. Railway Co. | Per package.<br>Boots and Shoes. |
| 1936. No. 353—July 1, 1936 | MARR, DOWNIE & CO. LTD., 48, Avenue Street, Bridgeton, Glasgow, and the L. & N.E. and L.M. & S. Railway Cos. | Per package.<br>Stationery and Stationers' Sundries. |
| 1936. No. 354—July 1, 1936 | JOSEPH MAY & SONS (LEEDS) LTD., Maenson House, Whitehall Road, Leeds, 12, and the L. & N.E. and L.M. & S. Railway Cos. | Per package.<br>Clothing. |
| 1936. No. 355—July 1, 1936 | M. SALM & SONS LTD., Modellus House, Wood Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per package.<br>Ladies' Wear. |
| 1936. No. 356—July 1, 1936 | GEORGE WEBB & SONS, Mentone Works, Brockton Street, Northampton, and the L.M. & S. Railway Co. | Per package.<br>Boots and Shoes. |
| 1936. No. 357—July 1, 1936 | WOOLLEY, SANDERS & CO. LTD., 128, 129 and 130, Wood Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per package.<br>Hats, Millinery, Millinery Trimmings and Materials, Handkerchiefs and Wooden Hat Blocks. |
| 1936. No. 358—July 1, 1936 | BELAM & BRINLEY, Collins Road, Totnes, and the G.W. Railway Co. | Per ton.<br>Rabbits (dead). |
| 1936. No. 359—July 1, 1936 | S. COLLIER & CO. LTD., Trowbridge, and the G.W. Railway Co. | Per package.<br>Cloth. |
| 1936. No. 360—July 1, 1936 | P. H. TONKIN LIMITED, 21/23, King Street, Truro, Cornwall, and the G.W. and Southern Railway Cos. | Per ton.<br>Rabbits (dead). |
| 1936. No. 361—July 1, 1936 | JOHN LOVEYS & CO. LTD., 64/69, Coweross Street, London, E.C.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per ton.<br>Boots, Shoes, Clothing and Hosiery. |
| 1936. No. 362—July 1, 1936 | MOORE & SONS, Looe, Cornwall, and the G.W. Railway Co. | Per ton.<br>Rabbits (dead). |
| 1936. No. 363—July 1, 1936 | G. ROBINSON & SONS (CORNWALL) LTD., Camelford, Cornwall, and the G.W. and Southern Railway Cos. | Per ton.<br>Rabbits (dead). |
| 1936. No. 364—July 1, 1936 | TONKIN BROS., Church Street, Kingsbridge, Devon, and the G.W. Railway Co. | Per ton.<br>Rabbits (dead). |
| 1936. No. 365—July 1, 1936 | UNITED DAIRIES LIMITED, 31, St. Petersburgh Place, London, W.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. and the Somerset and Dorset Joint Committee.<br>*Applicable also to traffic consigned by seven Associated or Subsidiary Companies.* | Per ton.<br>Butter, Cheese, Cream, Eggs, Poultry, Preserves, Honey, Lard, Margarine, Sauces, Condensed Milk, Advertising Matter and Stationery. |
| 1936. No. 366—July 1, 1936 | McGROUTHER LIMITED, Cornton Road, Stirling, and the L. & N.E. and L.M. & S. Railway Cos. | Per package.<br>Bacon, Margarine, Meat and Sausages. |
| 1936. No. 367—July 1, 1936 | SAML. HANSON & SON LTD., 14, Eastcheap, London, E.C.3, and the Cheshire Lines Committee and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. | Per ton.<br>Confectionery, Groceries, Preserves, Provisions, Lemons, Oranges and Nuts; Advertising Matter; Empties returned to Suppliers. |
| 1936. No. 368—July 3, 1936 | JOHN HORN (STOCKPORT) LIMITED, Bon Bon Works, Stockport, and the Cheshire Lines Committee and the L.M. & S. Railway Co. | Per ton.<br>Confectionery. |

# Railway Share Market

The stock and share markets generally have been more active this week, partly owing to the commencement of a new Stock Exchange account, and partly as a result of the favourable influence of the further reduction in the unemployment figures. Although the uncertainty as to the wages position continued to prevent expansion of interest in Home railway stocks, the latter show an improvement of from a half to one point on balance for the week, thanks to the response which prices made on Wednesday to the excellent traffic returns for the past week.

Owing to the belief that the returns would include the benefit of the usual end-June adjustments, good figures had been expected, but the aggregate increase of £215,000 for the week was in excess of anticipations. Moreover, the fact that the aggregate increase for the year to date is now over the two million level at £2,034,000 tended to draw more attention to the favourable progress in this respect. L.M.S.R. stocks were particularly good in view of the traffic gain of £119,000 for the past week. The 4 per cent. preference has improved on the week from 84¼ to 86½, the 1923 preference from 69¼ to 71½ and the ordinary from 22⅝ to 23⅛. L.N.E.R. first preference rose from 66¼ to 67 and the second preference is 24½, against 24, the £60,000 traffic increase being a favourable influence. Great Western ordinary put on half a point to 47¾ on growing confidence of a small interim payment. Southern deferred is unchanged on the week at 21¾ and the preferred is 91, against 91½, despite the fact that last week's traffic increase of £24,000 was in excess of general expectations. Fractional rises were shown by most of the debenture stocks of the main line railways. London Transport "C" was good, having risen on balance from 103¾ to 105¾.

There was a slightly better tendency in the ordinary stocks of the Argentine railways on the hope that if the upward movement in the price of wheat is continued it would benefit economic conditions in the Argentine. Central Argentine is 9¾, against 9½ a week ago, but B.A. Pacific and Entre Rios are unchanged on balance at 7½ and 8 respectively. On the other hand, the preference stocks were rather out of favour and have barely been maintained. Elsewhere, Leopoldina was again reactionary, having been under the influence of the report, while San Paulo lost a further point to 52½. Canadian Pacific held up fairly well and American railroad stocks showed few important changes.

## Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

| | Railways | Miles open 1935-36 | Week Ending | Traffics for Week: Total this year | Traffics for Week: Inc. or Dec. compared with 1935 | No. of Weeks | Aggregate Traffics to Date: Totals: This Year | Aggregate Traffics to Date: Totals: Last Year | Aggregate Traffics to Date: Increase or Decrease | Shares or Stock | Prices: Highest 1935 | Prices: Lowest 1935 | Prices: July 8, 1936 | Prices: Yield (See Note) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | £ | £ | | £ | £ | £ | | | | | |
| South & Central America. | Antofagasta (Chili) & Bolivia | 834 | 5.7.36 | 13,130 | + 550 | 27 | 364,740 | 333,980 | + 30,760 | Ord. Stk. | 23 | 14 15/16 | 17 1/2 | Nil |
| | Argentine North Eastern .. | 753 | 4.7.36 | 8,119 | + 306 | 1 | 5,102 | 6,602 | — 1,500 | ,, | 7 | 4 | 3 1/2 | Nil |
| | Argentine Transandine .. | — | — | — | — | — | — | — | — | A. Deb. | 49 1/2 | 30 | 47 1/2 | 8 7/16 |
| | Bolivar .. .. .. | 174 | June, 1936 | 6,209 | + 200 | 26 | 41,000 | 39,400 | + 1,600 | 6 p.c. Deb. | 13 | 5 | 10 | Nil |
| | Brazil .. .. .. | — | — | — | — | — | — | — | — | Bonds. | 14 | 11 | 16 | 3 1/8 |
| | Buenos Ayres & Pacific .. | 2,806 | 4.7.36 | 66,637 | — 11,200 | 1 | 43,029 | 69,841 | — 26,812 | Ord. Stk. | 10 1/2 | 4 7/8 | 8 | Nil |
| | Buenos Ayres Central .. | 190 | 20.6.36 | $100,500 | — $28,400 | 51 | $5,442,700 | $5,659,600 | — $216,900 | Mt. Deb. | 21 | 10 | 16 1/2 | Nil |
| | Buenos Ayres Gt. Southern | 5,084 | 4.7.36 | 111,072 | — 6,212 | 1 | 62,917 | 106,937 | — 44,020 | Ord. Stk. | 27 | 13 1/2 | 16 | Nil |
| | Buenos Ayres Western .. | 1,930 | 4.7.36 | 41,476 | — 9,200 | 1 | 19,508 | 37,507 | — 17,999 | ,, | 24 | 10 | 12 1/2 | Nil |
| | Central Argentine .. .. | 3,700 | 4.7.36 | 111,347 | — 18,567 | 1 | 59,698 | 112,413 | — 52,715 | ,, | 17 7/8 | 7 | 10 | Nil |
| | Do. .. .. | — | — | — | — | — | — | — | — | Dfd. | 9 | 3 1/4 | 6 1/2 | Nil |
| | Cent. Uruguay of M. Video | 273 | 27.6.36 | 11,975 | + 2,942 | 52 | 580,526 | 689,980 | — 109,454 | Ord. Stk. | 8 1/2 | 3 | 4 | Nil |
| | Do. Eastern Extn. | 311 | 27.6.36 | 2,762 | + 1,298 | 52 | 109,519 | 100,359 | + 9,160 | — | — | — | — | — |
| | Do. Northern Extn. | 185 | 27.6.36 | 1,769 | + 787 | 52 | 77,709 | 59,564 | + 18,145 | — | — | — | — | — |
| | Do. Western Extn... | 211 | 27.6.36 | 928 | + 323 | 52 | 45,128 | 38,696 | + 6,432 | — | — | — | — | — |
| | Cordoba Central .. .. | 1,218 | 4.7.36 | 36,500 | + 2,540 | 1 | 36,500 | 39,040 | — 2,540 | Ord. Inc. | 4 | 1 | 1 1/2 | Nil |
| | Costa Rica .. .. .. | 188 | May, 1936 | 17,449 | + 3,582 | 48 | 159,922 | 176,238 | — 16,316 | Stk. | 35 | 30 | 35 | 5 11/16 |
| | Dorada .. .. .. | 70 | May, 1936 | 13,600 | + 2,700 | 22 | 65,700 | 55,000 | + 10,700 | 1 Mt. Db. | 103 5/8 | 102 1/2 | 102 1/2 | 5/8 |
| | Entre Rios .. .. .. | 810 | 4.7.36 | 11,541 | — 511 | 1 | 6,374 | 10,370 | — 3,996 | Ord. Stk. | 15 | 6 1/2 | 8 1/2 | Nil |
| | Great Western of Brazil .. | 1,082 | 4.7.36 | 5,300 | + 300 | 27 | 210,300 | 216,900 | — 6,000 | Ord. Sh. | 1/2 | 3/16 | 1/2 | Nil |
| | International of Cl. Amer. | 794 | May, 1936 | $536,930 | + $39,880 | 21 | $2,617,600 | $2,260,638 | + $356,962 | — | — | — | — | — |
| | Interoceanic of Mexico .. | — | — | — | — | — | — | — | — | 1st Pref. | 1/2 | 5/32 | 1/2 | Nil |
| | La Guaira & Caracas .. | 22¾ | June, 1936 | 4,460 | + 545 | 26 | 27,340 | 23,845 | + 3,495 | Stk. | 8 1/2 | 8 | 5 1/2 | Nil |
| | Leopoldina .. .. .. | 1,918 | 4.7.36 | 20,934 | + 3,433 | 27 | 457,525 | 419,934 | + 37,591 | Ord. Stk. | 8 1/2 | 2 1/2 | 5 | Nil |
| | Mexican .. .. .. | 483 | 30.6.36 | $396,300 | + $71,500 | 26 | $6,881,100 | $6,374,700 | + $506,400 | ,, | 1 1/2 | 1/4 | 3/4 | Nil |
| | Midland of Uruguay .. | 319 | May, 1936 | 6,380 | + 53 | 48 | 78,664 | 106,076 | — 27,412 | ,, | 1 1/2 | 1 1/2 | 1 1/2 | Nil |
| | Nitrate .. .. .. | 401 | 30.6.36 | 5,858 | + 449 | 26 | 69,560 | 72,513 | — 2,953 | Ord. Sh. | 64/- | 42/- | 2 1/4 | Nil |
| | Paraguay Central .. .. | 274 | 4.7.36 | $2,869,000 | + $1,012,900 | 1 | $1,639,000 | $1,592,000 | + $47,000 | Pr. Li. Stk. | 80 1/2 | 60 | 75 5/8 | 8 |
| | Peruvian Corporation .. | 1,059 | June, 1936 | 83,124 | + 16,368 | 52 | 949,493 | 764,032 | + 185,461 | Pref. | 105 5/8 | 67 1/16 | 12 | Nil |
| | Salvador .. .. .. | 100 | 27.6.36 | ¢14,200 | — ¢1,850 | 52 | ¢984,936 | ¢1,062,132 | — ¢77,196 | Pr. Li.Db. | 65 | 61 | 40 | 12 1/2 |
| | San Paulo .. .. .. | 153½ | 28.6.36 | 31,165 | + 2,377 | 26 | 768,982 | 609,433 | + 159,549 | Ord. Stk. | 80 | 35 | 51 1/2 | 4 7/8 |
| | Taltal .. .. .. | 164 | May, 1936 | 3,010 | + 330 | 48 | 38,505 | 34,065 | + 4,440 | Ord. Sh. | 11 1/16 | 1 1/8 | 1 | 10 |
| | United of Havana .. .. | 1,353 | 4.7.36 | 17,838 | + 22 | 1 | 9,626 | 15,715 | — 6,089 | Ord. Stk. | 3 1/16 | 1 | 3 | Nil |
| | Uruguay Northern .. .. | 73 | May, 1936 | 817 | + 195 | 48 | 9,110 | 11,484 | — 2,374 | Deb. Stk. | 4 1/2 | 2 15/16 | 4 1/2 | Nil |
| Canada. | Canadian National .. .. | 23,617 | 30.6.36 | 917,145 | + 66,800 | 26 | 17,092,285 | 16,028,664 | + 1,063,621 | — | — | — | — | — |
| | Canadian Northern .. | — | — | — | — | — | — | — | — 4 p.c. | Perp. Dbs. | 78 5/8 | 52 1/2 | 67 1/2 | 5 11/16 |
| | Grand Trunk .. .. | — | — | — | — | — | — | — | — | 4 p.c. Gar. | 103 5/8 | 93 | 101 1/2 | 3 15/16 |
| | Canadian Pacific .. .. | 17,237 | 30.6.36 | 720,200 | + 82,600 | 26 | 12,469,000 | 11,305,800 | + 1,103,200 | Ord. Stk. | 14 1/16 | 8 3/4 | 12 1/2 | Nil |
| India.† | Assam Bengal .. .. | 1,329 | 10.6.36 | $5,340 | + 4,792 | 11 | 236,970 | 228,453 | + 8,517 | Ord. Stk. | 92 1/8 | 77 1/2 | 84 1/2 | 3 9/16 |
| | Barsi Light .. .. .. | 202 | 10.6.36 | 2,730 | — 697 | 11 | 24,758 | 27,435 | — 2,677 | Ord. Sh. | 105 | 77 1/2 | 72 1/2 | 6 5/8 |
| | Bengal & North Western .. | 2,112 | 20.6.36 | 70,983 | — 2,580 | 12 | 659,262 | 636,939 | + 22,323 | Ord. Stk. | 301 1/2 | 291 | 306 | 5 1/4 |
| | Bengal Dooars & Extension | 161 | 10.6.36 | 2,828 | — 69 | 11 | 21,477 | 22,118 | — 641 | ,, | 127 1/2 | 122 | 125 1/2 | 5 9/16 |
| | Bengal-Nagpur .. .. | 3,268 | 20.6.36 | 160,275 | — 18,872 | 12 | 1,423,650 | 1,521,018 | — 97,368 | ,, | 105 | 100 5/16 | 102 1/2 | 3 7/8 |
| | Bombay, Baroda & Cl. India | 3,072 | 30.6.36 | 215,025 | + 4,725 | 13 | 2,344,425 | 2,178,600 | + 165,825 | ,, | 115 1/4 | 110 | 111 1/2 | 5 7/8 |
| | Madras & Southern Mahratta | 3,229 | 10.6.36 | 156,750 | + 451 | 11 | 1,180,500 | 1,159,974 | + 20,526 | ,, | 128 1/2 | 113 7/8 | 112 1/2 | 8 |
| | Rohilkund & Kumaon .. | 561 | 20.6.36 | 13,865 | + 80 | 12 | 140,573 | 127,588 | + 12,985 | ,, | 294 | 262 | 301 1/2 | 5 5/16 |
| | South India .. .. .. | 2,531 | 10.6.36 | 119,682 | + 3,407 | 11 | 804,393 | 822,240 | — 17,847 | ,, | 119 5/4 | 104 1/4 | 103 1/2 | 5 5/16 |
| Various. | Beira-Umtali .. .. | 204 | Apr., 1936 | 60,712 | — 10,667 | 30 | 442,973 | 450,161 | — 7,188 | — | — | — | — | — |
| | Bilbao River & Cantabrian | 15 | June, 1936 | 1,397 | + 136 | 26 | 8,525 | 9,905 | — 1,380 | — | — | — | — | — |
| | Egyptian Delta .. .. | 620 | 20.6.36 | 5,694 | + 559 | 12 | 45,284 | 41,708 | + 3,576 | Prf. Sh. | 2 | 15/8 | 1 1/4 | 5 11/16 |
| | Great Southern of Spain .. | 104 | 27.6.36 | 1,157 | — 703 | 26 | 28,458 | 48,589 | — 20,131 | Inc. Deb. | 3 1/2 | 2 | 3 1/2 | Nil |
| | Kenya & Uganda .. .. | 1,625 | May., 1936 | 238,820 | + 37,731 | 22 | 1,226,510 | 1,129,621 | + 96,889 | — | — | — | — | — |
| | Manila .. .. .. | — | — | — | — | — | — | — | — | B. Deb. | 48 | 36 | 42 | 8 5/16 |
| | Mashonaland .. .. | 913 | Apr., 1936 | 100,263 | — 31,988 | 30 | 709,219 | 820,037 | — 110,818 | 1 Mg. Db. | 104 1/4 | 100 | 103 | 4 7/8 |
| | Midland of W. Australia .. | 277 | May, 1936 | 11,949 | — 1,099 | 48 | 149,410 | 147,835 | + 1,575 | Inc. Deb. | 98 5/4 | 93 | 93 1/2 | 5 5/16 |
| | Nigerian .. .. .. | 1,905 | 16.5.36 | 34,891 | + 3,641 | 7 | 225,937 | 200,239 | + 25,698 | — | — | — | — | — |
| | Rhodesia .. .. .. | 1,538 | Apr., 1936 | 179,844 | — 25,674 | 30 | 1,297,030 | 1,343,770 | — 46,740 | 4 p.c. Db. | 105 1/2 | 101 | 105 | 3 15/16 |
| | South African .. .. | 13,264 | 13.6.36 | 600,633 | + 81,272 | 11 | 6,099,551 | 5,688,257 | + 411,294 | — | — | — | — | — |
| | Victoria .. .. .. | 4,728 | Dec., 1935 | 866,995 | — 3,320 | 26 | 4,826,292 | 4,751,974 | + 74,318 | — | — | — | — | — |
| | Zafra & Huelva .. .. | 112 | Apr., 1936 | 9,003 | — 2,584 | 17 | 39,754 | 44,550 | — 4,796 | — | — | — | — | — |

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.

# Diesel Railway Traction

## The High-Speed Oil Engine

IT is frequently asserted that the quick-running diesel engine holds its place against petrol engines in railway work solely because the price of fuel oil is much less than that of petrol, and that for equal price the petrol engine would be the more economical unit. Of course, nothing is further from the truth. The consumptions of oil and petrol are of the order of from 1:1·6 to 1:2·0 for equal work, due to the higher thermal efficiency of the oil engine and the greater heat content of the fuel, so that unless the cost of fuel oil was one and a half to twice that of petrol the oil engine would still show a saving in the fuel bill. Moreover, experience with the best types of railcar oil engines shows that they are cheaper to maintain than an equivalent petrol unit, sometimes to the extent of 16 to 18 per cent., and the fact that it is still heavier per unit of power than the rival engine is not a great handicap, for at the moment it is only in very special instances that anything can be gained by going below 11 or 12 lb. per b.h.p. and there are numerous successful designs ranging from this figure to 16 lb. per b.h.p. In price the oil engine is still appreciably above that of a standard size petrol engine, but this extra cost can be recouped relatively quickly by the saving in fuel costs. We were given recently the figures for a small railcar powered by a 70 b.h.p. engine of good but expensive make, and they showed that the extra cost was recouped in fuel alone after a mileage of 8,000. The fire risk attendant upon the use of a petrol engine is apt to be overlooked or belittled, but while accidents are rare the holocausts which followed the accidents to petrol cars in Italy and Brittany two or three years ago are not altogether forgotten, and the former accident alone was largely responsible for the complete reversal of the Italian policy from petrol to oil-engined cars.

## Diesels for the Orient

THE diesel-mechanical railcars recently exported from France to Indo-China, and briefly described elsewhere in this issue, are now operating on one of the most difficult lines in the world, the so-called Yunnan railway. Beginning at Haiphong on the Gulf of Cochin, this line runs northwest and over the Chinese frontier into the province of Yunnan. The line north of the frontier is cut through mountain ranges rising to over 7,000 ft. and has long sharply-curved grades of 1 in 40. On the route is the famous Faux Nan-ti viaduct, which has a span of 215 ft. and a height of 335 ft. The journey of 530 miles between the termini hitherto has taken two days, but with the introduction of the diesel cars the journey is now made within 24 hr., and all the intermediate times being accelerated in a like manner, traffic over the more civilised section in Indo-China is being recaptured from the road. Between the port of Haiphong and the capital of Indo-China, Hanoi, the new cars are maintaining an interurban service at end-to-end speeds of 45-50 m.p.h., and maintain also the through Haiphong-Yunnan services twice or thrice a week without necessitating an all-night journey. The design of the cars follows that of the double-engined cars built by Decauville for the Northern Railway of France, and described in the issue of this Supplement for March 23, 1934. Like the Nord cars, the Indo-China vehicles have Saurer engines, S.L.M.-Winterthur mechanical transmission, roller bearings, and air brakes acting on drums inside the wheels, and buffing and drawgear is fitted to enable trailers to be hauled as required.

## The Diesel Streamliner

THERE is no evidence as yet to indicate any falling off in the popularity of streamlined diesel trains, and although the rate of their construction does not seem to accelerate, a steady flow of these sets is to be found. In Germany, new four-car rakes have been ordered, and in Belgium and France several two-car and three-car trains have been put into operation since the inauguration of the summer timetables in May. Further streamlined set trains are under construction for French, Italian, and Spanish railways and in America two new cross-continent services have been inaugurated within the last four weeks. Especially as it concerns the size and length of such trains in America, the predetermination of engine output and train performance involves a number of new factors on which there are very little data, and at the overall speeds now run, equivalent to a mile-a-minute for over a day and a half on end, air resistance plays an important part. Although there are certain rules extant which enable the air resistance of three- and four-car trains of aerodynamical form to be calculated with reasonable accuracy, their correctness under various railway conditions needs further verification, and with the introduction of ten- and eleven-car trains some modification of them is necessary. All that can be done at the moment to counter this unknown factor, and also the various climatic, geographic and operating features in runs exceeding 2,000 miles, is to provide a power unit of ample capacity. Yet this is a matter of some difficulty for big trains, and despite an aggregate output of 2,400 b.h.p. the engines of the latest American super-speed train (see elsewhere in this issue) is only 5·4 b.h.p. per ton of tare or 4·9 b.h.p. per ton of gross weight. Certainly all this is available for propulsion, as the auxiliary services are supplied by a separate small power plant, but even so the figures are a good deal less than found in the Continental flyers, where 9 b.h.p. per ton of tare, or 8 b.h.p. allowing for auxiliaries, is a normal value, and in which the cross-sectional area of the train is slightly less than in the American examples, where the average b.h.p. per ton of tare of all the trains is only 5·1. However, a good deal of experience on the necessary power-weight ratio has been obtained in America, particularly with the City of Portland train, which had its make-up raised from six to seven cars and its engine output from 900 to 1,200 b.h.p. after a short time in service.

# METAL AIRCRAFT CONSTRUCTION APPLIED TO DIESEL TRAIN

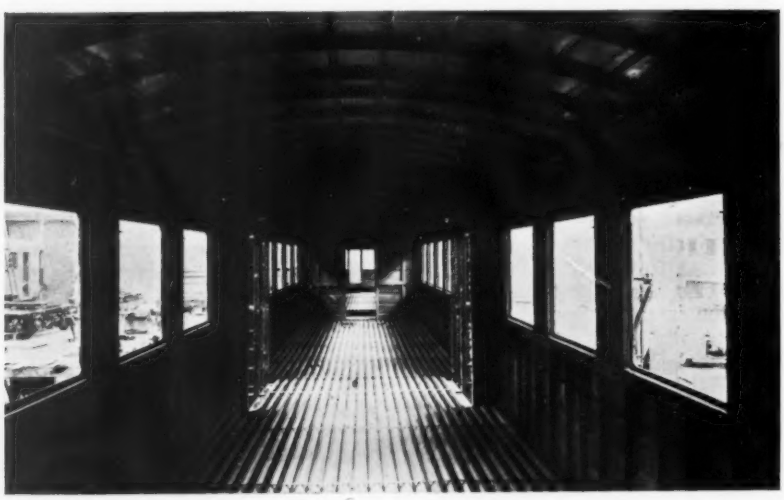
## *400 b.h.p. twin-car set running on the Weimar-Berka-Blankenhain line in Germany*

*Two-car articulated diesel-electric train with welded steel body*

A DOUBLE-CAR articulated diesel-electric train embodying some unusual features of construction has been set to work on the standard-gauge lines of the Hermann Bachstein Secondary Railways, in Germany. Built by the Düsseldorfer Waggonfabrik A.-G., the body and framing are built up as an integral structure on principles evolved from metal aircraft construction by Dr.-ing. Croseck. The double-car unit is fitted with standard buffing and drawgear to enable it to haul trailers when required, and in order to resist the combined stresses resulting from the drawbar pull, track movements, passenger load, and the weight of the vehicle itself, with a minimum of weight; the body and frame are in the form of a thin-walled tube, the sides of which are stiffened by longitudinal tubular ribs welded to the side panels. Further bracing is obtained by thin-walled columns welded to the side panels and extending from the floor to the cantrail. The floor and roof are of corrugated sheets of 1 mm. thickness, except for the centre portion of the roof, which has a thickness of 2 mm.; the side panels are 1·5 mm. thick and are carried down below floor level in the form of curved aprons, cut away round the bogies.

The train can be driven from either end, but the driving position at one end is not shut off from the passenger saloon. At night a spring-roller blind is lowered to shield the lights of the passenger portion from the driving windows. At each end of the train is a door and hinged platform to give access to the trailers. Although one of the passenger saloons has a length of approximately 55 ft. it has no internal partitions, and the passengers have an uninterrupted view. As may be seen from one of the illustrations reproduced with this article the interior is exceptionally light and airy, and must form a distinct advance in third class travel compared with the steam-hauled local trains on the same line.

Only the upper portion of the windows are made to



*Interior of car showing body framing, floor, and roof of steel. The roof and floor plates are of corrugated sheets and thin tubes are welded to the outside panel plates to give increased stiffness*

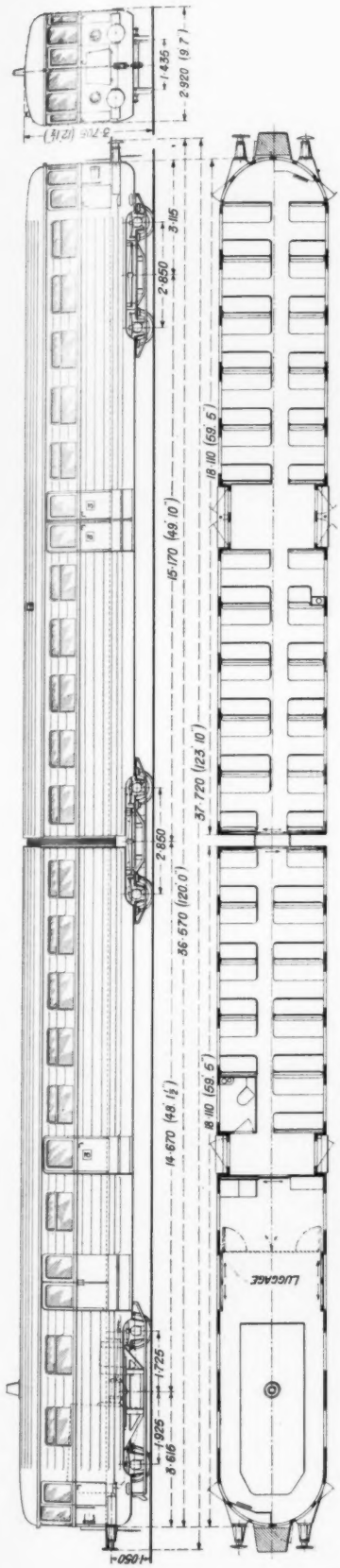
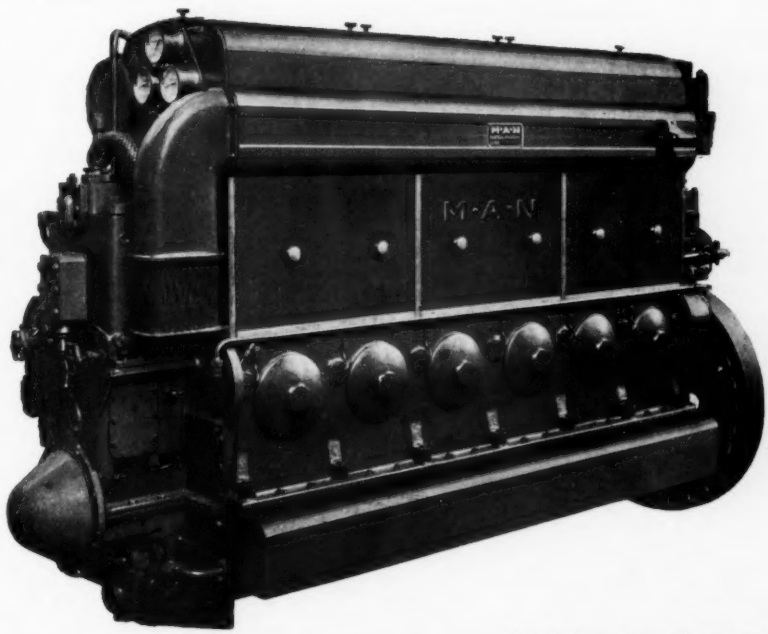



*Diagram of 360 b.h.p. diesel-electric train of the Hermann Bachstein Secondary Railways*

*Third-class interior*

open and they drop over the lower half, so that no pockets are necessary in the side panels and there is thus a certain saving in weight. The interior surface of the side panels is lined in Canadian birch. There is a double row of electric lights down the ceiling, and there are also lamps over the entrance doors which are controlled automatically by the opening and closing of the swing doors. The doors in the luggage compartment are of the sliding type.

Power is provided by a six-cylinder M.A.N. engine having a continuous rating of 360 b.h.p. at 900 r.p.m. and a top rating of 400 b.h.p. at 1,000 r.p.m. It is direct coupled to a Brown Boveri d.c. generator and the combined unit is mounted on the bogie at one end. The two electric traction motors drive the wheels of the Jacobs articulation bogie, and the bogie at the other end is simply a carrying truck. The train is fitted with Westinghouse air brakes, but has an oil-pressure brake for use in shunting. The sanding gear, signal bell, and Typhon horn are operated by compressed air from the brake system. The train tares 37 tonnes, of which 15 tonnes represent the weight of the engine and electrical equipment. The seating capacity is 143 third class.




**360 *b.h.p. M.A.N. engine***

# MAIN LINE DIESEL-ELECTRIC LOCOMOTIVE IN THE U.S.A.

*1,800 b.h.p. locomotive of the Baltimore and Ohio Railroad*

FOR several months the Baltimore & Ohio Railroad has been operating in passenger service a 1,800 b.h.p. diesel-electric locomotive built by the Electro-Motive Corporation. The locomotive consists of a single-cab unit of steel construction, with a welded underframe mounted on two four-wheel bogies, each having two nose-suspended traction motors. The bogies are equipped with one-piece cast-steel frames, National-Isothermos axleboxes on 6¾ in. by 12 in. journals, and clasp-type brakes.

The power plant is made up of two units each consisting of a Winton two-stroke 900 b.h.p. 12-cylinder vee engine directly coupled to a main generator. The engines have 8 in. by 10 in. cylinders and operate at 750 r.p.m.: they weigh approximately 20 lb. per b.h.p. Independent sets of electric transmission, furnished by the General Electric Company of America, are provided for each engine, and the motors of each group are on the bogie immediately below that engine. Each set of transmission consists of a generator, two traction motors, and control contactors for connecting the motors to the generator in the proper sequence, and for reversal of direction of motion. There are no mechanical or electrical connections between the two power plants other than an electric throttle and controller which controls both units from a single control station at the front end of the locomotive.

A multiple-unit control system is fitted, and the entire control system centres around a trunk line extending from one end of the locomotive to the other and terminating at each end in a plug socket, from which a jumper is used to carry the trunk lines to the next locomotive. The various circuits in this trunk line, which operates on a battery circuit, feed contactors which control the different pieces of apparatus in the locomotive.

The driver's control station is equipped with a master controller, reverse lever, throttle lever, brake valves, sander valve, speed recorder, control switches and instrument panel, grouped around the seat so as to permit the greatest ease of operation. The controller lever has three running positions and is equipped with a reversing handle. The throttle has eight running positions in addition to idling and stop positions. Through electro-pneumatic linkage the throttle operates a Woodward variable-speed governor, which in turn controls the engine speed. Switches which control engine starting, fuel pump operation, and the exciter field are located on the side of the throttle stand. Light control switches are located over the operator's side windows. The instrument panel has air gauges and warning lights for low oil supply and overheated engines. On each of the main engines there is an instrument panel on which is mounted a tachometer, cooling water thermometer, and fuel and lubricating-oil pressure gauges.

Three auxiliaries—a four-cylinder two-stage air compressor having a capacity of 158 cu. ft. per min.; a battery-charging generator; and a traction-motion blower—are driven by a Winton six-cylinder four-stroke 90 b.h.p. oil engine. The battery charging generator is a 30-kW. 76-volt machine and the Exide 32-cell battery has a capacity of 450 amp. hr. at a ten-hour rate.

Steam for train heating is provided by a Vapour-Clarkson oil-fired coil type boiler, having an evaporative capacity of 1,600 lb. of water per hr. at a working pressure of 200 lb. The boiler is entirely automatic in operation, and boiler-water storage capacity of 1,250 U.S. gal. is provided. The locomotive is equipped with the New York air brake.

The principal weights and dimensions of the locomotive are as follow: Length over coupler knuckles, 65 ft. 9 in.; wheel dia., 36 in.; bogie wheelbase, 8 ft. 6 in.; pitch of bogies, 40 ft.; max. width of loco, 10 ft. 4 in.; weight in working order, 116 Engl. tons; tractive effort at rims at 50 m.p.h., 11,750 lb.; starting tractive effort, 50,400 lb.

This locomotive was tried originally on the celebrated Royal Blue Express of the Baltimore & Ohio Railroad, but it was felt that the drawbar horsepower available at high speeds was hardly sufficient to keep schedule. The locomotive at the moment is in service on the Abraham Lincoln, one of the crack expresses of the Alton Railroad, a subsidiary of the B. & O.

# DIESEL TRACTION IN CEYLON

ELSEWHERE in this Supplement we note the remarks on diesel traction of Mr. E. W. Head, the General Manager of the Ceylon Government Railways in his report for the year 1936. The set trains which Mr. Head mentions in his report have now been ordered from the English Electric Co. Ltd. as announced in the issue of this Supplement for May 15. These three four-car sets of semi-streamlined form are intended primarily for use on the Colombo Fort-Galle-Matara section, but their use on the Colombo-Peradeniya section is envisaged also, and on this line there are grades up to 1 in 45 and the height attained is 1,750 ft. above sea level.

The passenger accommodation is made up of 17 first class, 42 second class and 255 third class seats. Dunlopillo cushions are to be used throughout the train, and every endeavour is being made to provide comfortable and attractive accommodation for the passengers. Fans, drop windows, and lift-up louvres are being provided, and there is lavatory accommodation for each of the three classes. An air space of 2¼ in. is provided between the inner and outer ceilings.

The two end coaches of each train are to be identical and interchangeable, and each will incorporate a driver's cab, engine, luggage and passenger compartments. It is possible, if desired, to remove one of the trailer coaches, thus converting the train into a three-coach unit. The overall length of the four-car train will be 206 ft. 6 in. and the width 10 ft. The underframe is to be a fabricated structure of the plate girder type and the body framing is integral with it. The two outer bogies are to be the normal type of motor bogie, each carrying two standard nose-suspended motors driving the axles through straight gears and pinions. The three articulated bogies do not carry traction motors.

There are to be two power units to each four-car set and each will consist of an English Electric six-cylinder engine developing 180 b.h.p. at 1,350 r.p.m. under normal conditions, and capable of a maximum output of 200 b.h.p. at 1,500 r.p.m. The engine and generator will be rigidly coupled together, and the exciter is to be overhung from the generator. These will form a self-contained unit which is to be arranged for three-point suspension, so as to eliminate any distortion due to flexing of the underframe of the coach.

Each power unit will be mounted in an engine compartment immediately behind the driver's cab, and will be complete with all accessories such as radiators and silencer. The control is to be arranged so that two four-car trains can be operated in multiple unit.

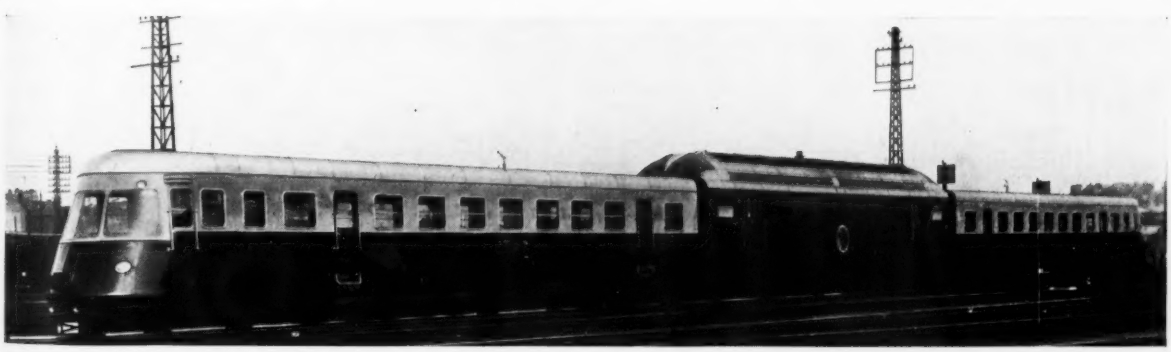
All the engines may be started or stopped from any one driver's cab by press button control. Each engine is to be provided with a motor-driven priming pump for the lubricating oil, and on the depression of a button in the driver's cab this priming pump will be set in motion and will run until the lubricating oil pressure is built up, when the engine will be started up automatically from its own battery.

Pilot lights are to be provided in each driver's cab, by means of which the driver will be able to tell whether each engine is running satisfactorily. In addition to these visual warnings, in the event of a failure of the cooling water system, a dangerous fall in the lubricating oil pressure, or a dangerous rise in temperature, the engine shuts down automatically. The engine controls in the driving compartment are to consist of the engine starting button, direction key, and speed controller only, as the characteristics of the electrical system will automatically prevent overloading and will adjust the road speed to the power output. Automatic air brakes are to be fitted and the brake rigging is designed to apply two blocks per wheel. Two air compressors are to be provided per four-car unit, one in each engine compartment.

The new trains will be capable of doing the journey between Colombo Fort and Galle in 2 hr. 17 min., stopping at four intermediate stations, and subject to a maximum speed limit of 45 m.p.h. The journey between Galle and Matara, stopping at all stations, will be done in 1 hr. 7 min., subject to a maximum speed limit of 35 m.p.h.

The entire work on this contract is being carried out by the English Electric Company in its own shops. The engines are being built at Rugby, the electrical gear at Bradford, and the coach bodies, underframes and bogies at Preston. After the coaches have been completed and erected a final test will be carried out on each four-car unit on the test track which the English Electric Company possess at its Preston works. The vehicles are being built to the inspection of the Crown Agents for the Colonies.

## 1,000 b.h.p. Streamlined Train for the French State Railways



*This illustration shows the new Renault double-engine* 1,000 *b.h.p. diesel-mechanical train for the Etat. Its technical features were fully described in the issue of this Supplement for November* 29, 1935

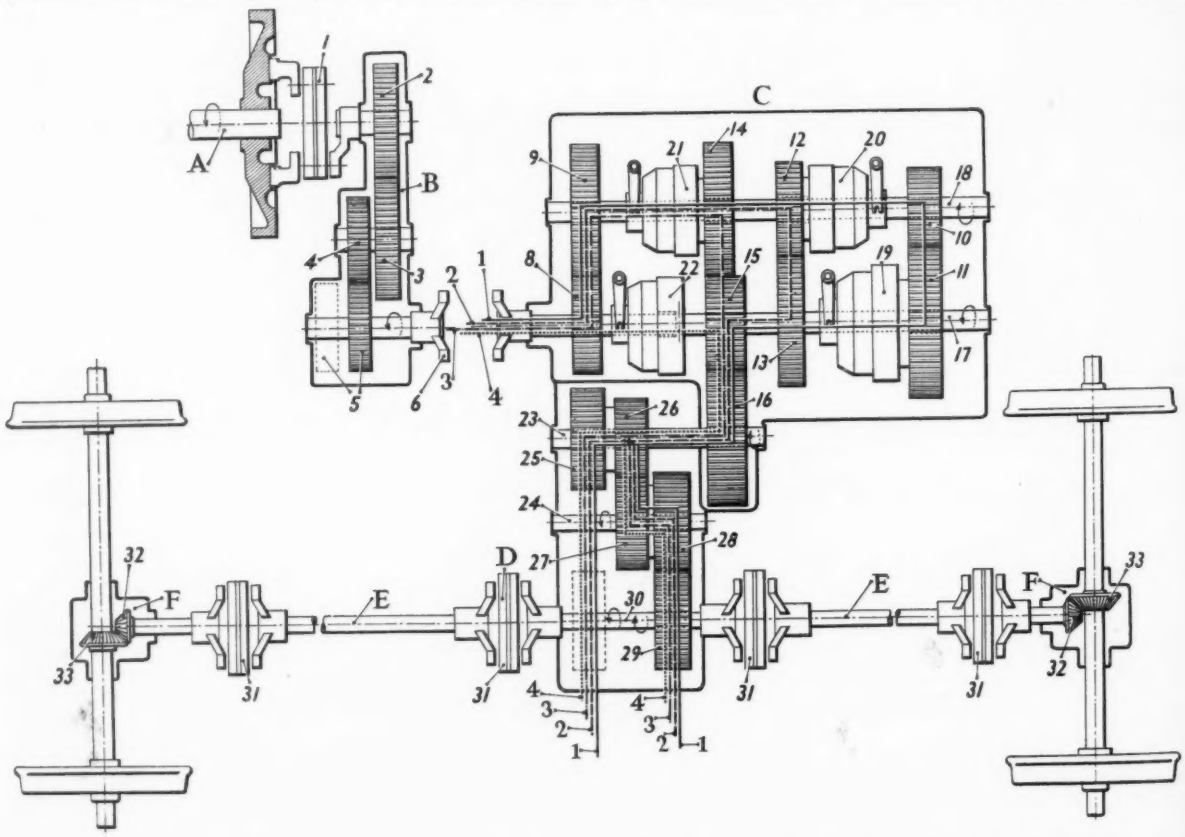
# TRANSMISSIONS FOR DIESEL LOCOMOTIVES AND RAILCARS

## *The Ganz constant-mesh gearbox*

*By STUART MIALL, B.Sc.*

IN the *Diesel Railway Traction Supplement* for July 12, 1935, there appeared a diagrammatic general arrangement of the five-speed mechanical transmission fitted to some standard gauge railcars built for the Egyptian State Railways by Ganz, of Budapest. The illustration accompanying this article shows a four-speed modification of the Ganz transmission incorporating several improvements, and utilised in the metre-gauge railcars supplied to the Argentine State Railways and described in the issue of this Supplement for May 15, 1936. In these cars the engine—a Ganz-Jendrassik diesel unit developing 9 per cent. more power than the one used on the Egyptian State Railways—is mounted at a higher level than in standard and broad gauge cars, there being insufficient room for it between the wheels. Gearwheels 1, 2, 3, 4, and 5, comprising unit *B* in the illustration, connect the engine shaft *A* to the much lower input shaft of the gearbox *C*. One of these, namely 5, is axially slidable so that the engine can, if necessary, be completely isolated from the gearbox. The maximum speed required being lower for the metre-gauge car than for the Egyptian cars, four gear ratios were deemed sufficient. These are called into operation by engaging, one at a time, the clutches 19 (drive via 8, 9, 10, 11 and 15 as shown by continuous line marked *1*), 20 (drive via 8, 9, 12, 13 and 15 as shown by broken line marked *2*), 21 (drive via 8, 9, 14 and 15 as shown by chain-dotted line marked *3*), and 22 (drive direct to wheel 15 as shown by dotted line marked *4*). The gears in *C* are always in mesh, but, whereas wheels 8, 9, 10, 13, and 15 are keyed permanently to the shafts carrying them, wheels 11, 12 and 14 run free until locked to the shafts carrying them by the engagement of clutches 19, 20, and 21. Clutch 22 serves to unite shaft 17 and the input shaft. The clutches are held in engagement by air pressure, the full value being applied in turn to all clutches as the change-speed control is moved into positions *1, 2, 3* and *4*. With the control in the initial or starting position a reduced pressure of 1·5 atmospheres (22 lb. per sq. in.) is applied to the first speed clutch, and the fuel supply to the engine is simultaneously limited to prevent the development of an unnecessarily high torque. Wheelspin at starting, and the risk of burning out clutch 19, are obviated with this improved starting control, and it has not been found necessary to retain the main clutch provided in earlier railcars between engine and transmission. Such slippage as occurs in the new cars at starting can be permitted to take place in the relatively small gearbox clutches, and a simple Hardy disc coupling (marked 1 in the diagram) suffices to connect the engine and transmission.

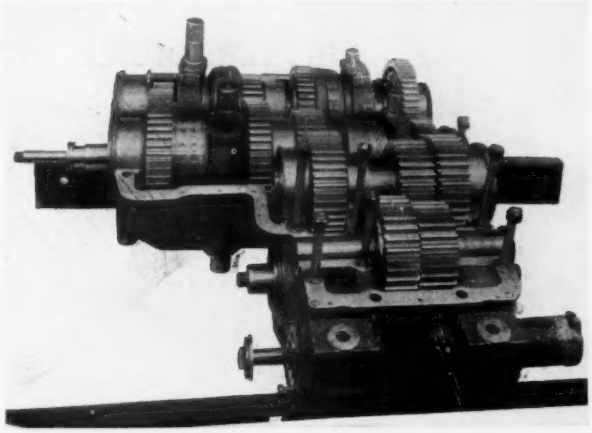
In the new arrangement the change-speed and reversing gears are combined to form one unit. Formerly the




*Diagrammatic arrangement of Ganz four-speed gearbox as used on cars for the Argentine State Railways*

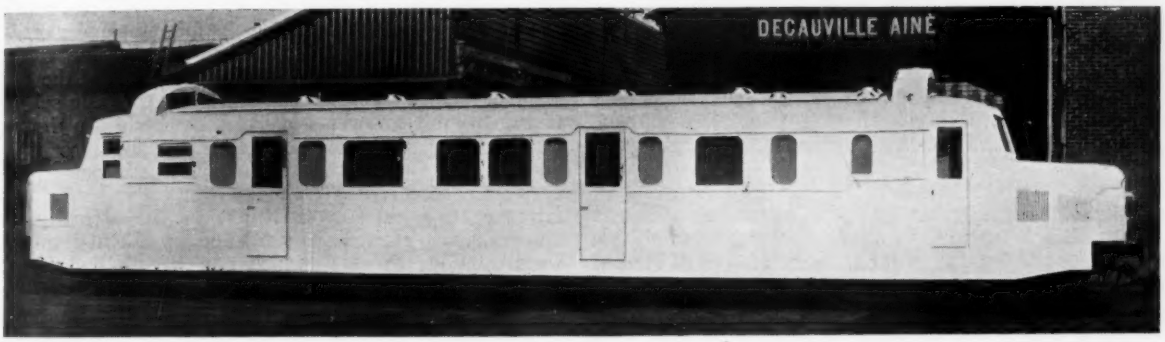
reversing gear came between the engine and the change-speed gearbox, and it was separated from the latter. In the new transmission it comes between the change-speed gearbox and the axle-drive bevel wheels 32 and 33. For clarity, shaft 24 is shown in the same plane as shafts 23 and 30 but since, when it is pushed to occupy the position where it is shown dotted, wheel 29 must mesh directly with wheel 25, the real position of shaft 24 is behind shafts 23 and 30, which are much closer together in reality than they appear to be in the diagram. Flexible couplings are incorporated in the transmission layout at the points marked 6 and 31 in the accompanying diagram.

The provision of a separate clutch for each gear ratio is a feature which the Ganz transmission shares with nearly all other modern mechanical transmissions having successful railway application. Single clutch transmissions of the automobile type, while very common even now in the lightest shunting locomotives and railcars, are almost completely superseded by the multi-clutch systems where engines developing more than 100 b.h.p. are employed.



*Ganz four-speed gearbox*

## RAILCARS FOR INDO-CHINA




*280 b.h.p. double-engine diesel-mechanical railcar for the Yunnan Railway*

SIX double-engine bogie railcars have been set to work on the metre-gauge lines of the Cie. Française des Chemins de fer de l'Indo-Chine et du Yunnan, commonly known as the Yunnan Railway, which runs from the Indo-China port of Haiphong into the Chinese province of Yunnan.

Built by the Etablissements Decauville Ainé, the vehicles are powered by two Saurer BXD engines each developing 140 b.h.p. at 1,500 r.p.m. On each bogie is mounted the engine, certain of its auxiliaries, a four-speed S.L.M.-Winterthur oil-operated mechanical transmission, and air brake reservoirs and cylinders. The four steps of the gearbox give road speeds of 20·8, 35·6, 58·2, and 90·0 km.p.h. (13, 22, 36, and 56 m.p.h.). The bogies have a patent type of elastic wheel and the axles are carried in roller bearings with underhung laminated springs. Channel-section pressings are used for the main frames of the bogies, and the bogie headstocks carry the railway's standard screw coupling. The aid brakes operate shoes on drums integral with the wheel centres.

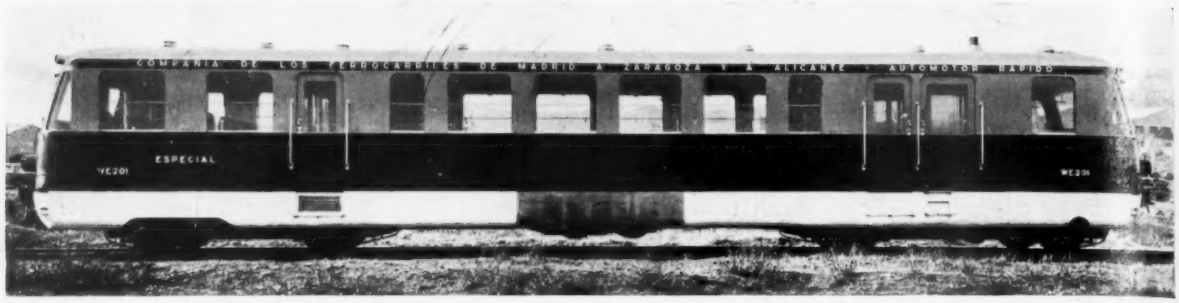
The body is of steel construction, all welded, and extends to a length of 60 ft. over the headstocks. The bogies have wheels of 35½ in. diameter spread over a wheelbase of 8 ft. 9 in. and are pitched at 38 ft. 8 in. centres. The seating of the cars is in two classes, but there are three different arrangements in the six vehicles. The lighting is electric and the circuits are fed from a nickel-cadmium battery of 204 amp. hr. capacity, which supplies also the current for the engine starting motors and certain auxiliaries. The generator is of 750 watts capacity and is driven by the engine. The cars tare 22 tonnes and weigh about 27 tonnes with a full complement of passengers. Their normal schedules call for the maintenance of a speed of 35-36 m.p.h. up a grade of 1 in 40.

AMERICAN DIESEL ORDERS.—The Boston & Maine Railroad has placed an order for three 600 b.h.p. diesel-electric shunting locomotives with the Electro-Motive Corporation, and the Portland Terminal Company has ordered three shunting locomotives of the same power from the American Locomotive Company.

THE FLYING YANKEE.—On April 1, 1935, the *Flying Yankee,* one of the 600 b.h.p. three-car Zephyr type of stainless steel diesel-electric trains went into regular passenger service on the Boston & Maine and Maine Central Railroads. Including a number of special excursion trips operated just before that date, the mileage up to May 13, 1936, was 225,439, equivalent to an average of 195,000 a year. The train is scheduled to run 730 miles a day, which means that it has completed its duty 267 days a year. In the first 12 months of its service the Flying Yankee carried 95,524 passengers with a revenue of $266,864.

# FURTHER DIESEL ADVANCE ON THE M.Z.A.

## *A dozen railcars are now in service on the broad-gauge lines*




*The first of the four oil-electric cars with Burmeister & Wain two-stroke engines*

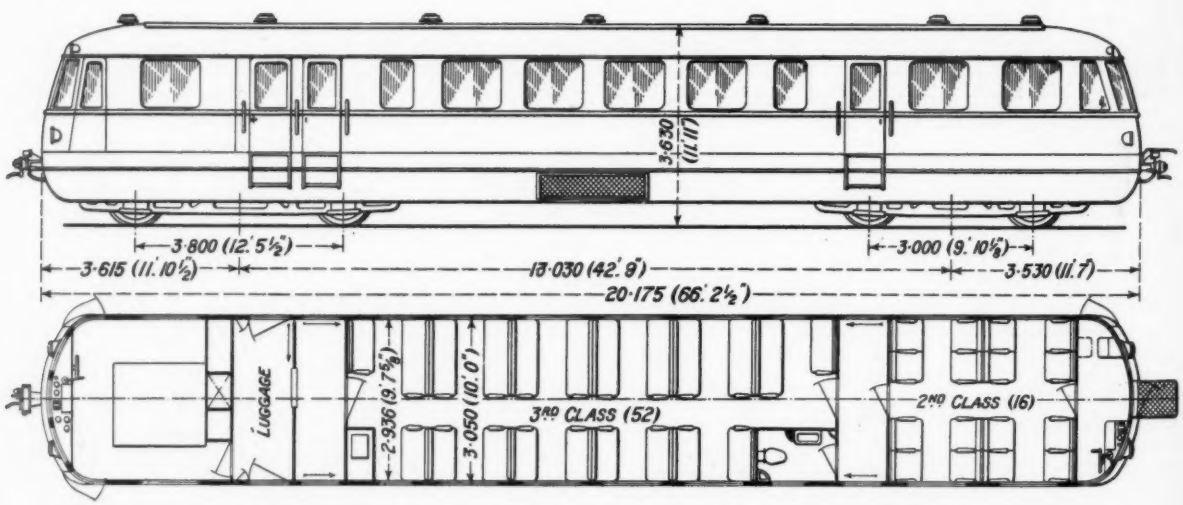
THE latest additions to the railcar stock of the Madrid Zaragossa & Alicante Railway are four 260 b.h.p. cars with Burmeister & Wain two-stroke engines and the first two of six 265 b.h.p. Renault cars. Normally, the Renault vehicles will work solo, but as occasion arises the Burmeister engined cars will haul one of the four driving trailers which up to the present have been used with the 410 b.h.p. Maybach cars (Nos. WE 401-04) described in the issue of this Supplement for January 24 last.

### SPANISH-BUILT CARS

Built by the Maquinista Terrestre y Maritima, the cars with Burmeister engines (No. WE. 201-04) have electric transmission, and are used for fast services out of Madrid with speeds up to a maximum of 100 km.p.h. (62 m.p.h.). They have a driving cabin at each end and a seating capacity of 56 general class and 16 special class passengers, the seats being arranged as shown by the diagram at the bottom of this page. The tare weight is 40 tonnes and the weight with a full complement of passengers 48·6 tonnes, giving ratio of 5·5 b.h.p. per ton of gross weight, 3·6 b.h.p. per seat, and 1,225 lb. per seat on the tare basis.

As with the Maybach-engined cars the bodies are of all-steel welded construction, but in this case there are one or two joints in which bolts have been used. During the welding of the side and end panels and the roof to the body framing the assembly was held in circular cradles by means of which the whole body could be turned. Channel and angle sections are used for most of the body framing and for the underframe, but for the main solebars of the latter it was necessary to incorporate two dropped sections of plate in order to clear the footsteps at the doors into the passenger saloons. The main outside solebars are carried round the ends of the car in semi-circular form as may be seen from one of the accompanying illustrations. The car is ventilated by Flettner rotating ventilators in the roof, which can be adjusted by the passengers. Heating of the passenger saloons is effected by circulating the engine cooling water.

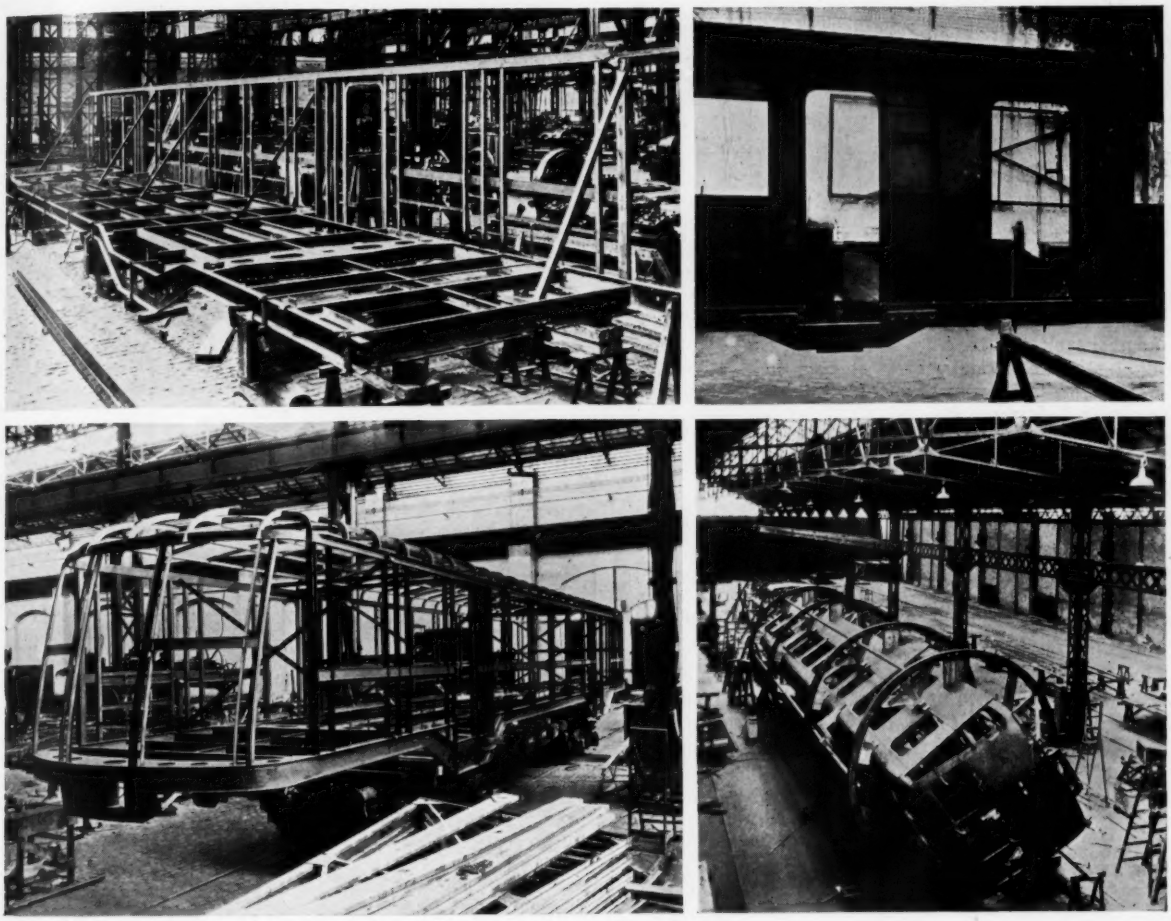
Welded construction has been used also for the bogies, one of which, with a wheelbase of 12 ft. 5½ in., carries the engine and main generator, and the other, with a wheelbase of 9 ft. 10 in., is driven by two nose-suspended traction motors. In each case deep plate frames outside the wheels are used, and they are braced at the ends by exceedingly stiff plates welded to the main frames. On the driving bogie these stiffening plates extend over




*General layout of 260 b.h.p. diesel-electric railcar with bogie-mounted engine*

virtually the whole of the top of the bogie, large holes being cut for the pivot castings, side bearer, and springs, and for the inspection of the motors. The engine bogie has two additional inner frames composed of channel-shaped pressings which extend from end to end and carry the engine and generator. These inside frames are supported by strong box-like structures located at two places on each main frame plate.

Independent laminated springs with rubber auxiliaries are used for all axles, and the axleboxes are of the S.K.F. roller bearing type. A curious point is that sand is applied to the wheels of the engine bogie as well as to the driving wheels. Braking is on the Knorr compressed air system with one cylinder per bogie and blocks applied to all wheels. Hand brakes are fitted also. The wheels are of 920 mm. (36 in.) diameter.



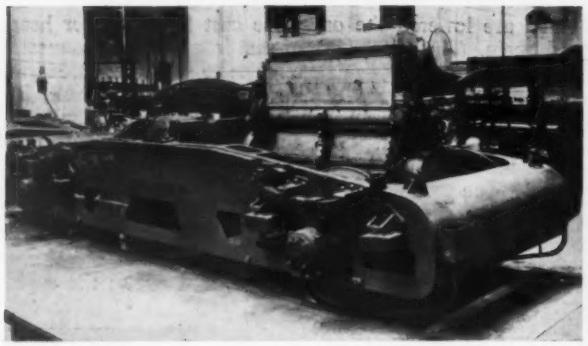
*Details of the all-steel welded body and underframe and their manufacture of the 260 b.h.p. diesel-electric cars built for the M.Z.A. by the Maquinista Terrestre y Maritima*

## Engine and Transmission

Power is provided by a six-cylinder two-stroke engine built by Burmeister & Wain. The continuous output is 260 b.h.p. at 1,200 r.p.m. and the one-hour rating 280 b.h.p at the same speed. The cylinders have a bore of 135 mm. (5·32 in.) and the pistons a stroke of 220 mm. (8·65 in.). Taking the continuous rating as a basis, the weight is equivalent to 14·5 lb. per b.h.p. The crankcase and cylinder block are in a single integral casting into which are lowered the one-piece cast iron cylinder heads and liners. The pistons are of cast iron, and are connected through fully-floating gudgeon pins to the Siemens-Marten steel connecting rods. These rods are of I section, but have a hole drilled right up the centre for the lubrication of the gudgeon pin. The hollow-bored crankshaft is of chrome-nickel steel, with bearings of white metal on steel shells. The cylinder pressure load is taken by long bolts extending from the main bearing caps to the cylinder heads.

The electric transmission is arranged on the Lemp system as modified by the A.E.G., and allows the engine to work at 750, 1,000, and 1,200 r.p.m. The main generator is coupled to the engine through a short cardan shaft with universal joint and a coupling with some torsional flexibility; it has a continuous capacity of 158 kW. at 550 volts at a speed of 1,200 r.p.m. The maximum current is 600 amp. The exciter is mounted on a prolongation of the main generator armature shaft, and operates in conjunction with a Nife alkaline battery of 94 cells with a capacity of 100 amp. hr. at the 5-hr. rate of discharge.

Current is supplied by the main generator to two self-ventilated traction motors driving the axles through ordinary spur gearing having a ratio of 3·58:1. Each motor has a continuous rating of 65 kW. at 550 volts and 1,330



*Engine bogie with Burmeister & Wain two-stroke engine and its generator in position*

*Welded steel engine-bogie frame structure for the M.Z.A. 260 b.h.p. railcars*

r.p.m., and a one-hour rating of 90 kW. at the same voltage and a speed of 1,180 r.p.m. The aggregate starting tractive effort is 3,200 kg. (7,100 lb.) and this is available up to 18 km.p.h. (11·2 m.p.h.); against the adhesion weight in working order it gives a factor of adhesion of 7·5.

Multiple-unit control is incorporated to allow of two cars or one car and a driving trailer being coupled together and driven by one man from any driving position. The electric circuits, brake piping, and mechanical coupling between one vehicle and another is effected by the Scharfenberg automatic coupler, which is carried on the car underframe.

Tests on a straight level section of the main line gave the following acceleration figures when the railcar was running alone:—

| | |
|---|---|
| 40 km.p.h. (24·8 m.p.h.) | 36 sec. |
| 50 km.p.h. (31·0 m.p.h.) | 51 sec. |
| 60 km.p.h. (37·3 m.p.h.) | 72 sec. |
| 70 km.p.h. (43·5 m.p.h.) | 105 sec. |
| 80 km.p.h. (49·7 m.p.h.) | 154 sec. |
| 90 km.p.h. (56·0 m.p.h.) | 195 sec. |

Over the Madrid-Cuenca section which has heavy grades including a stretch at 1 in 56 which was surmounted at a speed of 53 km.p.h. (33 m.p.h.) the fuel consumption was 0·44 kg. per km. (1·56 lb. per mile) for an end-to-end speed of 76·5 km.p.h. (47 m.p.h.) for the 125 miles. Tests over this section with a Burmeister-engined 260 b.h.p. car and a Maybach 410 b.h.p. car gave the following results:—

| | B. & W. car | Maybach car |
|---|---|---|
| B.h.p. | 260 | 410 |
| Gross weight, tonnes | 48 | 49 |
| B.h.p. per ton of gross weight | 5·4 | 8·4 |
| Average speed, Madrid-Cuenca (125 miles) | 47 m.p.h. | 54·7 m.p.h. |
| Speed up 1 in 56 grade | 33·0 m.p.h. | 53·4 m.p.h. |
| Maximum speed | 59 m.p.h. | 69·5 m.p.h. |
| Acceleration from rest on straight level | 56 m.p.h. in 195 sec. | 62 m.p.h. in 117 sec. |
| Fuel consumption for return trip of 250 miles | 386 lb. | 389 lb. |
| Fuel consumption per train-mile | 1·545 lb. | 1·557 lb. |

Thus despite the much bigger engine and the higher speed the fuel consumption of the Maybach scarcely differed from that of the smaller vehicle.

## RENAULT CARS

The Renault vehicles (Nos. WM 226-231) are simply broad-gauge adaptations of the standard unit running on the French lines. They seat 16 special class and 55 general class passengers on a tare weight of 31 tonnes and within an overall length of 82 ft. 6 in., and in addition have lavatory and luggage accommodation. The engine and gearbox are mounted on the underframe at one end and drive the wheels through a vertical bevel shaft and cardan shafts. Both axles of the driving bogie are driven and the adhesion weight with a full complement of passengers is 19·5 tonnes.

*Renault 265 b.h.p. railcar for the M.Z.A. broad gauge lines*

# A NEW G.W.R. DIESEL-ELECTRIC SHUNTER

***Well-tried design capable of handling trailing loads of 1,000 tons is being used in arduous service in a big goods yard in the metropolitan area***

*The second diesel locomotive of the G.W.R. with the side covers removed*

A HEAVY diesel-electric shunting locomotive has been purchased recently by the Great Western Railway and is now in operation at Acton yard. Built by the English Electric Co. Ltd. in conjunction with Hawthorn-Leslie, this locomotive is very similar to the ten built for the L.M.S.R. (see issue of this Supplement for April 17) but has certain Great Western standard fittings.

Weighing 51·5 tons in full working order, with a maximum axle load of 17·9 tons, the locomotive is capable of hauling 1,000 tons on the level at 9·5 m.p.h. under optimum conditions, and 500 tons at 19 m.p.h. The wheelbase is 11 ft. 6 in. equally divided, and the overall length 29 ft. 0½ in. The wheels are of 4 ft. 1 in. diameter and the two outer axles are driven by nose-suspended traction motors, the three axles being coupled together by coupling rods mounted on flycranks, as the axleboxes are outside the frames.

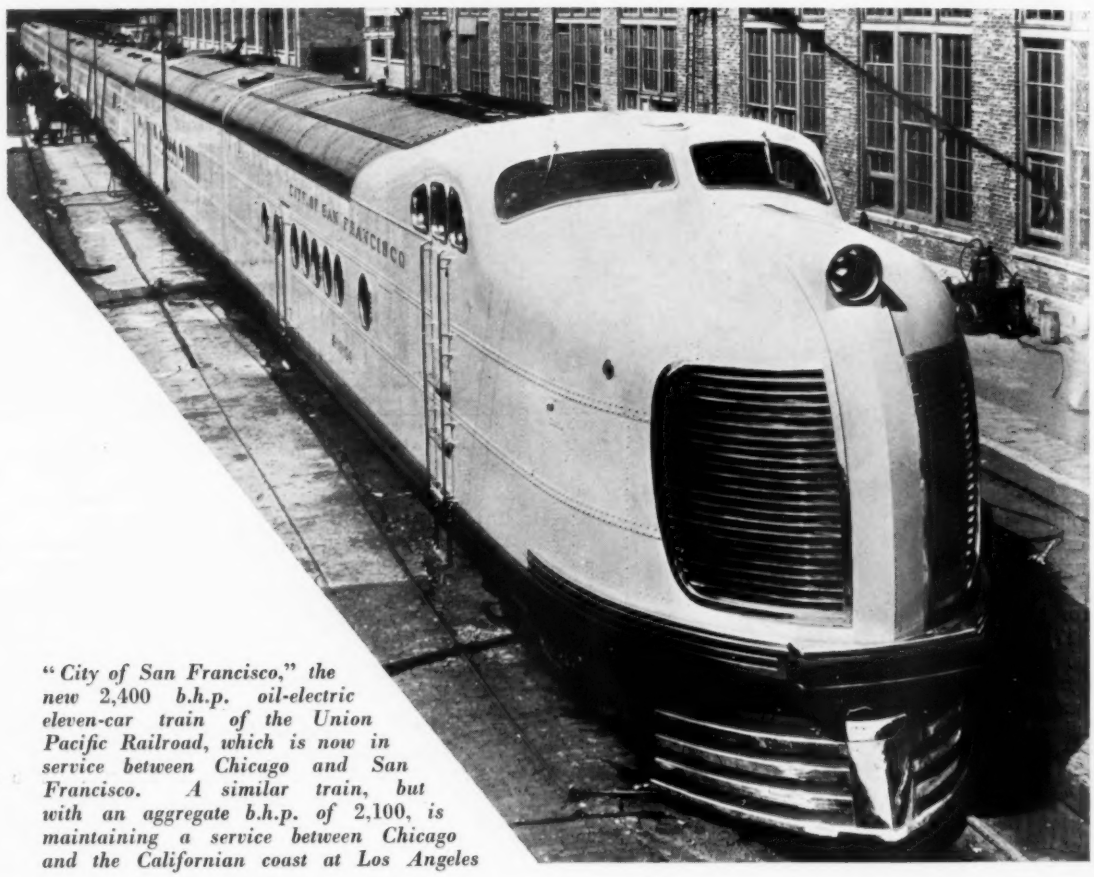
Power is provided by an English Electric oil engine with a continuous rating of 350 b.h.p. at 680 r.p.m. It has six cylinders with a bore of 10 in. and a stroke of 12 in. and is equipped with C.A.V.-Bosch fuel pump and injection nozzles. An engine-driven centrifugal pump circulates the cooling water through certain elements of the radiator, and a further pump similarly driven, forces the lubricating oil through the remaining elements. The radiator fan is thermostatically controlled. Electric starting is used, the main generator being used as a motor and supplied with current from a battery. The main fuel tanks are arranged at the sides of the engine bonnet and have an aggregate capacity of 400 gal. plus 100 gal. in the service tank, which is arranged in the roof.

*350 b.h.p. shunter at work in the Great Western yard at Acton*

**Diesels in Ceylon.**—The following is an extract from the report of the General Manager of the Ceylon Government Railways for 1935: Interesting experiments in the application of diesel engines to railway traction have been carried out during the year. The 20-ton diesel-electric shunting locomotive working in the Ratmalana workshops yard has now been in service for over a year and has proved a very reliable and economical unit. Trials were also carried out on open line with two 880 b.h.p. diesel-electric locomotives sent out on loan by Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd. Although the government finally decided against the purchase of these two locomotives, their performance while hauling the Indian mail trains on the Talaimannar line very clearly demonstrated the economies in operation which may be expected from the introduction of diesel-engined units and very valuable experience was gained by the technical officers of the railway department during the period of the trials. It is proposed to import three diesel-electric trains and two diesel railcars for service on the coast line during 1936.

# New Cross-Continent Diesel Trains in America

## *Union Pacific inaugurates Chicago-California service*




***"City of San Francisco," the new 2,400 b.h.p. oil-electric eleven-car train of the Union Pacific Railroad, which is now in service between Chicago and San Francisco. A similar train, but with an aggregate b.h.p. of 2,100, is maintaining a service between Chicago and the Californian coast at Los Angeles***

TWO new streamlined air-conditioned diesel-electric trains have been put into service on the Union Pacific route between Chicago and the Pacific coast. Both are 11-car articulated sets, the first of 2,100 b.h.p. and the second of 2,400 b.h.p. The Union Pacific now has three streamlined diesel-electric trains, and one distillate-electric train in service, and two further diesel-electric trains on order for early delivery, as under.

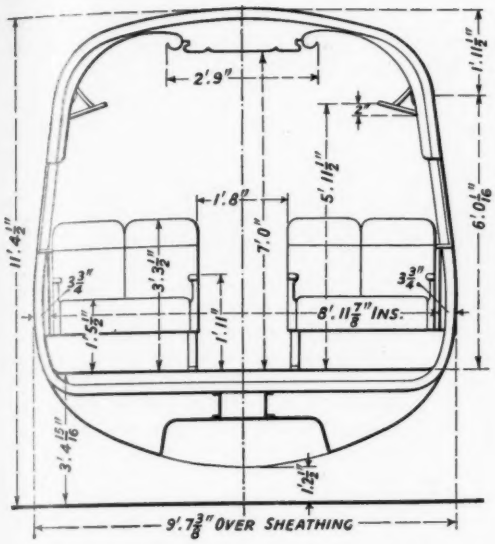
City of Los Angeles has one 12-cylinder 900 and one 16-cylinder 1,200 b.h.p. engines, the 900 b.h.p. unit being that taken from City of Portland when that train was increased from six to seven cars and from 900 to 1,200 b.h.p. The two new trains are now operating between Chicago and the respective cities of which they bear the names on a schedule of 39¾ hr. Before the end of the summer the two 12-car City of Denver trains will be completed, and will operate on a 16 hr. schedule over the 1,048 miles between Chicago and Denver.

Apart from the differences in the engine plants and the corresponding variations in the electric transmissions, the main variations between the City of Los Angeles and the City of San Francisco are that the former has S.K.F. roller bearing axleboxes throughout, New York air brake equipment, and two Vapor oil-fired heating boilers with a

| Date placed in service | Number | Name | Aggregate b.h.p. | Number of cars | Type of train |
|---|---|---|---|---|---|
| January, 1934 | M-10000 | *City of Salina* | 600 | Three | Distillate-electric. |
| September, 1934 | M-10001 | *City of Portland* | 1,200* | Seven† | Diesel-electric. |
| May, 1936 | M-10002 | *City of Los Angeles* | 2,100 | Eleven | Do. |
| Summer, 1936 | M-10003 | Spare unit | 2,400 | Two power cars | Do. |
| June, 1936 | M-10004 | *City of San Francisco* | 2,400 | Eleven | Do. |
| Summer, 1936 | M-10005 | *City of Denver* | 2,400 | Twelve | Do. |
| | M-10006 | | 2,400 | Twelve | Do. |

* Originally 900 b.h.p.

† Originally six cars.




*Cross section of one of the passenger cars*

capacity of 1,200 lb. each, whereas City of San Francisco has Timken roller bearing boxes, Westinghouse air brakes, and two 1,600 lb. Vapor boilers.

In each case the power equipment is housed in the two front cars of the train; these cannot be operated as separate vehicles, for there is a driving position only in the leading vehicle. City of Los Angeles is 714 ft. long, tares 424 Engl. tons and weighs 465 Engl. tons gross, of which about one-third is due to the two power cars. City of San Francisco is 725 ft. long, tares 446½ Engl. tons and weighs 488 Engl. tons gross. Behind the second power car each train is virtually the same in arrangement and consists of nine cars with a capacity of 170 passengers, comprising 84 in the Pullman sleepers and 86 in the coaches. In addition there are 32 seats in the diner, 16 in the lounge, and 8 in the card room. The extra through fare for the ordinary cars is $5 and for the Pullman passengers $10 over the standard Pullman fare. Each power car is carried on two four-wheeled trucks, but the nine passenger vehicles are articulated in one rake.

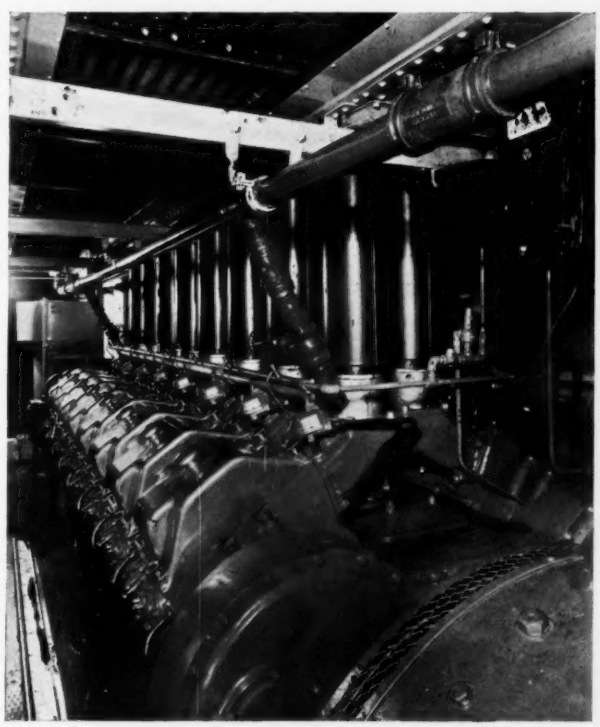
Winton two-stroke vee engines are used in both trains, the cylinders in all cases having a bore of 8 in. and a stroke of 10 in., and the speed being 750 r.p.m. The electric transmission was supplied by the General Electric Company of America and includes eight 300 h.p. nose-suspended traction motors. Auxiliaries are supplied with power by two 60 b.h.p. Winton four-stroke engines coupled to 220 volt three-phase 60 cycle alternators. Two 32-cell Exide-Ironclad 450 amp. batteries are fitted to each train for the engine starting, transmission control and power car lights.

## Body Design and Construction

The locomotive body units of M-10002 are built of aluminium alloys throughout, with the exception of alloy-steel end sills and body bolsters. They comprise practically an unbroken tubular section, except for the removable roof hatch provided for the entry and removal of power plants. The thickness of the aluminium-alloy side sheets is $\frac{5}{16}$ in., this thickness extending into the curve of the roof and the bottom sheets. The thickness of the removable roof panel and of the centre portion of the bottom sheets is $\frac{1}{8}$ in. The centre sills consist principally of two girder sections 28 in. deep formed of $\frac{1}{4}$-in. plate with 6-in. by 4-in. by $\frac{3}{8}$-in. angles, spaced widely apart to form a power-plant well.

There are no side sills, other than a continuous $\frac{3}{8}$-in. by 12-in. reinforcing plate placed outside of the sheathing at the usual side-sill height and extending the length of the car structure. These, with the centre sills, the bottom sheets and heavy floor plates, form rigid box beams at each side of the power-plant well. A similar construction is provided at the top corners on each side of the removable roof section which has a centrally located depressed trough open at the top to contain the exhaust drum or muffler. The engine-cooling radiators are located inside on each side of the depressed trough and secured directly to the removable roof. There are openings in the side sheets of the trough for the expulsion of cooling air from the radiators. The side posts are extruded aluminium Z-sections, 3 in. deep, $\frac{1}{4}$ in. thick and with 2 $\frac{11}{16}$-in. flanges. These side posts extend entirely around the car section except at the opening for the removable roof.

The trailing body units are built of aluminium alloys throughout, with the exception of such parts as body bolsters and end sills which are of high-tensile alloy steel. The structures are of tubular form with side and roof sheets 0·156 in. thick. Each body has a box-type centre sill comprising two 10-in. 8·84-lb. aluminium channels with $\frac{3}{8}$-in. by 20-in. top and bottom cover plates so designed as to resist a buffing load in excess of 400,000 lb. Centre sills are connected to the side sills and sheets with $\frac{1}{8}$-in. pressed-pan needle beams spaced approximately 6 ft. apart down the car, with floor stringer supports spaced between the needle beams. The side sill is a special extruded aluminium section continuous in length throughout the car. The side posts are extruded flanged channel sections extending continuously from the lower edge of the needle beam to the top centre of the roof, forming continuous side posts and roof carlines. Immediately below the roof are longitudinal members, extending the



*Winton 1,200 b.h.p. engine as used in the Union Pacific trains*

full length of the car and comprising extruded aluminium sections with numerous flanges for attachment thereto of the frame members and ceiling. These channels, in combination with the roof and a bottom sheet, form the duct for air conditioning.

The trailing body units of M-10004 are identical in every respect with those of M-10002. The locomotive bodies, however, are quite different, being 11 ft. 3 in. longer and made of Cor-Ten steel with straight vertical sides, with the cab set further back. The front air intake grilles are chromium-plated. The thickness of the Cor-Ten steel sheathing in M-10004 is as follows: 13 gauge for the removable portion of the roof, for the sides, and for the curved bottom sheets adjacent to the sides of the car; 16 gauge for the centre bottom sheets below the power-plant well; and 11 gauge for the curved sheets of the roof adjacent to the sides of the car. The side posts are 3-in. Z-section weighing 5·1 lb. per ft. The centre sills at the power-plant well are Z-sections 26-in. deep, having $\frac{1}{4}$-in. webs and $\frac{3}{8}$-in. flanges $3\frac{1}{4}$ in. wide. They are formed of plates and angles electrically welded together. Side sills are provided in these structures, in contrast to their omission in M-10002, and are formed of $3\frac{1}{2}$ in. by $3\frac{1}{2}$ in. by $\frac{5}{16}$ in. angles.

While both of the new trains embody primary riveted construction, there is a total of 2,839 ft. of arc welding in M-10002 and 352 lb. of welding rod was used. On M-10004, including the Cor-Ten steel power car bodies, there is a total of 7,690 ft. of arc welding, and 822 lb. of welding rod was used.

### Power and Trailer Trucks

Each of the four-wheel equaliser-type power trucks has an 8-ft. 4-in. wheelbase, 36-in. diameter rolled-steel wheels, and roller bearings mounted on special forging-quality carbon-steel axles. Cast-steel channel-shape side frames are provided, with transom and end frames cast separately and bolted to the side-frames. The spring suspension includes a double combination of long-travel coil equaliser springs and elliptic bolster springs. The truck frame is supported on equaliser springs seated on drop equaliser bars. All truck springs are made of either silico-manganese or chrome-vanadium steel, heat-treated. Unit braking is used, with four cylinders per truck. The clasp brakes are designed for four $12\frac{1}{2}$-in. shoes per wheel.

Spherical-type truck centre plates are cast as part of the truck bolster and sealed to form an oil reservoir for lubricating. All wear plates are of manganese steel with ground finish, and the manganese-steel bearing surfaces are supported by rubber and wood blocks encased in the cast-steel side-bearing supports. The trailer trucks are the new Union Pacific Pullman-Standard four-wheel type with 8-ft. wheel base and 34-in. diameter cylindrical-tread rolled steel wheels. The frames are heat-treated alloy-steel castings.

## Publications Received

**M.A.N. Railcars.**—Three leaflets on M.A.N. oil-engined railcars have reached us from Mr. Milton Sellex, the M.A.N. agent in this country. The first illustrates and briefly describes various four-wheeled cars powered by M.A.N. engines, the second deals with double-bogie cars with the 420 b.h.p. vee engine, and the third with cars having the 560 b.h.p. supercharged engine.

**M.A.N. History.**—A four-page leaflet giving a brief chronological account of the M.A.N. contribution to the development of the diesel engine for various purposes was presented to the members of the Institution of Locomotive Engineers during the recent tour in Germany. In the field of rail traction, we note that over 600 engines, with an aggregate capacity of 125,000 b.h.p., have been supplied, and that the most modern types of M.A.N. railcar engines weigh $12\frac{1}{4}$ to $15\frac{1}{2}$ lb. per b.h.p.

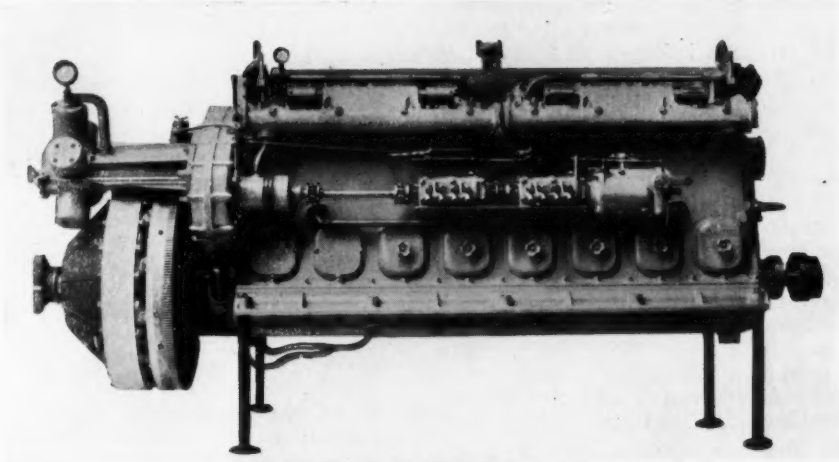
**Harlandic Locomotives.**—"Oil Engine Traction" is the title of the latest brochure issued by Harland & Wolff Limited. It gives illustrations and brief particulars of diesel locomotives, built by Harland & Wolff and by their Danish associates, Burmeister & Wain. No illustrations or designs of railcars are included, which is surprising in view of the success which has attended certain cars powered by Burmeister & Wain engines. From the brief description of the Harland-B. & W. two-stroke engine which is included, we note that the use of the auxiliary piston for scavenging has been given up and a rotary blower substituted. Various transmissions have been given short notices, including the S.L.M.-Winterthur oil-operated mechanical type, a licence for which is now held by Harland & Wolff Limited.

**Light Alloys.**—A reprint from the *Metal Industry* of the paper entitled "Light Alloy Practice," read by Mr. H. G. Warrington before the Midland Metallurgical Societies has been sent to us by High Duty Alloys Limited, of Slough. Dealing with recent developments in the technique of aluminium and magnesium alloys, it contains useful information about the properties of alloys such as Elektron and Hiduminium, and the casting and forging processes associated with the different brands. Notes are included on the protection from corrosion of alloys of both bases, and there are several illustrations depicting high speed oil engine constituents.

**Combustion-Chamber Design for Heavy Oil Engines.** By Paul Belyavin. London: Constable & Co. Limited. $7\frac{1}{4}$ in. by 5 in. 87 pp. Price 3s. 6d. net.—The subject of heavy oil engines has become so vast that the time is more than ripe for the appearance of a number of small works giving full details of various phases, rather than a continuation of the present style of heavy tomes which are apt to attempt to cover the whole range at the expense of the quality of the information. Mr. Belyavin's book is the first of the new type to reach us, and it deals with a matter which needs clarification in the eyes of the majority of engineers concerned with oil engines. In eight chapters the author covers the requirements of a combustion chamber and its effect on efficient fuel combustion, the mechanical efficiency of the engine, and the cylinder pressures, and he notes also the influence of the fuel itself on the combustion process. The various types of combustion chambers are illustrated clearly by undimensioned diagrams, and the turbulence in them described. The author lays emphasis upon the necessity of having controlled turbulence of a non-rotative type. Although his treatment of his subject is general rather than detailed or mathematical there is concentration of much useful material that hitherto has been scattered among a large number of books, periodicals and papers.

AN OPPORTUNITY FOR BRAINS.—According to the *Scientific American* a cash prize of $1,000 has been offered by Mr. Ralph Hemphill, President of the Hemphill Diesel Engineering Schools, Inc., for the best diesel invention submitted before midnight, April 30, 1937. With it will go a silver trophy to be held for one year.

# GLENIFFER OIL ENGINE FOR SHUNTING LOCOMOTIVE



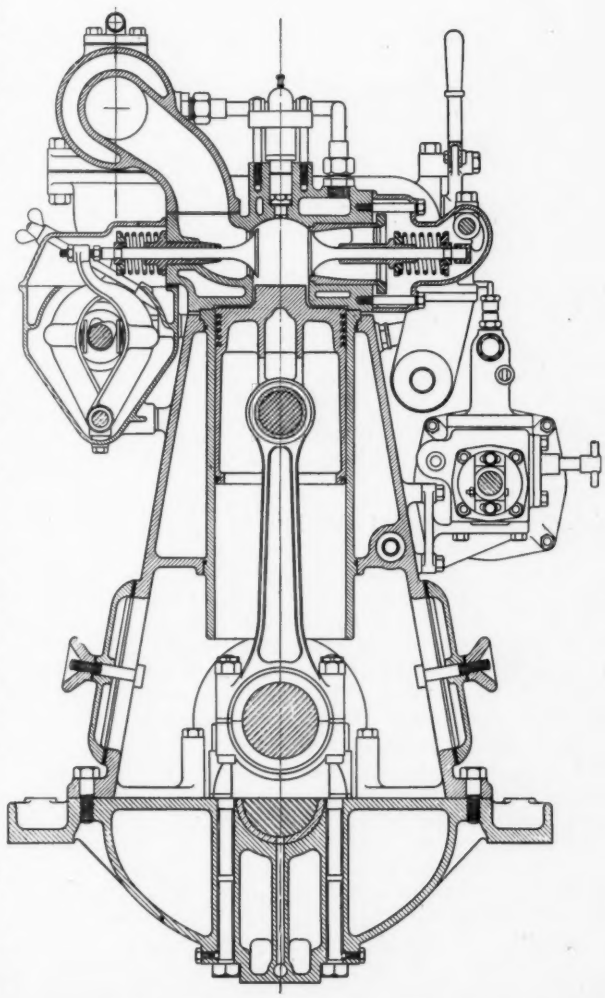
*160 b.h.p. engine with Vulcan-Sinclair fluid coupling*

THE diesel shunting locomotive being built by Andrew Barclay & Sons Ltd. for the Air Ministry is to be powered by a Gleniffer four-stroke engine of a size not hitherto used in traction service. It is of the maker's D.C. series, used extensively in marine work, but suited to the requirements of shunting work where the smallest weight and bulk are not essentials.

Within eight cylinders having a bore and stroke of 6 in. by 7 in. a continuous output of 160 b.h.p. is developed, this rating corresponding, at the normal speed of 900 r.p.m., to a brake m.e.p. of 89 lb. per sq. in. and a piston speed of 1,050 ft. per min. Cast iron is used for the crankcase and cylinder block, which are separate pieces bolted together, and also for the cylinder heads. Wet liners of a hard wear resisting cast iron are used. The crankshaft is carried in nine bearings consisting of gunmetal shells lined with whitemetal, and this type of bearing is used also at the connecting rod big ends. The valves are horizontal and are contained in a narrow vertical combustion chamber; the inlet valve is arranged in a cage, and by removing this cage and its valve the exhaust valve can be withdrawn. The camshaft is driven by duplex roller chains, and is bolted together in sections, one section for each cylinder.

Hard aluminium alloy is used for the pistons, which have one scraper and five pressure rings. The gudgeon pin is hollow of casehardened steel, and is of the fully floating type. The constant-stroke fuel pump is of Gleniffer's own make and is operated from the camshafts through rollers and tappets. The fuel is filtered first by passing through an Auto-Klean strainer, and then through a fine-mesh monel metal gauze. An Auto-Klean strainer is fitted also to the lubricating oil circuit, which operates normally at a pressure of 15 to 25 lb. per sq. in.

In the present railway application this Gleniffer engine is being used in conjunction with a Vulcan-Sinclair fluid coupling, which is shown attached to the engine.



*Section through Gleniffer D.C. type engine*

MR. A. H. CRANMER. — Maybach Gears Limited, of Lincoln House, High Holborn, London, W.C.1, has appointed as its technical director Mr. A. H. Cranmer, M.I.A.E. For many years Mr. Cranmer was technical director of Lagonda Limited, and in this capacity was responsible for the first application of the Maybach transmission to British automobiles.

# NOTES AND NEWS

**Small Diesel for Sweden.**—The Deutsche Werke Kiel A.G. has received an order for a diesel-mechanical locomotive from the municipality of Kristianstad, in Sweden.

**S.L.M. Transmission.**—Approximately 160 sets of the oil-operated mechanical transmission of the Swiss Locomotive & Machine Works are in operation on, or on order for, diesel railcars and locomotives.

**D.E.U.A. Secretary.**—Owing to the retirement of Engr. Rear-Admiral J. Hope Harrison from the position of Joint Hon. Sec. of the Diesel Engine Users Association, Mr. A. T. Hobbs has been appointed Secretary. Mr. H. V. Stead, the other Joint Hon. Sec. is now Hon. Sec.

**American Diesel Locomotive Factory.**—The big plant laid down at McCook, Ill., by the General Motors Corporation (of which the Winton Engine Company is a division) is now in operation. The building of this factory was noted in our issue of September 6, 1935, page 393, and also on p. 1009 of the May 17, 1935, issue.

**L.P.T.B. Diesel Cars.**—The London Passenger Transport Board has ordered two of the standard A.E.C. 260 b.h.p. streamlined diesel-mechanical railcars for service on the Metropolitan Chalfont-Chesham branch. They are to be fitted with air-operated doors and a form of electro-pneumatic multiple-unit control with a deadman handle. The cars will seat 70 passengers and will have a normal top speed of 65 m.p.h.

**Danish Diesel Stock.**—The Danish State Railways now have in service 12 diesel locomotives, 30 diesel railcars, and 4 three-car set trains. A further 10 railcars and 4 four-car set trains are on order. Taken over a number of years the cost of maintenance and repairs for single-engined cars has averaged 8 to 10 ore per km. and for double-engined vehicles 15 to 18 ore per km.

**German Three-Car Trains.**—On page 176 of our January 24 issue the tare weight of the Reichsbahn triple-unit diesel trains powered by two supercharged Maybach engines aggregating 1,200 b.h.p. was given as 113 tons. This figure refers to the two rakes with Voith hydraulic transmission. We understand that the tare weight of the two trains with electric transmission is about 9 tons greater.

**More American Diesel Cars.**—The Seaboard Air Line has recently acquired two streamlined single-unit diesel-electric railcars each powered by a 600 b.h.p. two-stroke Winton engine with a 60 b.h.p. engine for the auxiliaries. The cars are of all-welded alloy steel construction, and are used for hauling up to four ordinary passenger cars.

**New Railcars on the Etat.**—The French State Railways has on order six 500 b.h.p. double-bogie single-unit railcars of the type which made the record run on the Paris-Strasbourg-Mulhouse-Belfort-Paris line in December (see page 183, January 24 issue). Also on order for the Etat are two double-car articulated trains each powered by two of the new standard Renault 300 b.h.p. engines.

**Renault Oil Engines.**—Additional to the 16-cylinder 500 b.h.p. engine first installed in a railway vehicle at the end of last year, the Renault company has brought out a new engine, of 300 b.h.p. It is based upon the standard 12-cylinder vee engine of 250/265 b.h.p. but has four valves per cylinder in place of two and changes in the valve gear, camshaft and cylinder heads. This new construction is to be applied to all future Renault engines.

**A Million Miles of Zephyrs.**—The four diesel-electric stainless steel Zephyr trains in service on the Chicago Burlington & Quincy Railroad completed an aggregate of 1,000,000 train miles on May 27. The original *Burlington Zephyr* and the *Mark Twain* are now operating on a 16-hour schedule over the 1,039 miles between Chicago and Denver, pending the delivery of the two 10-car trains, the order for which was noted in the February 21 issue of this Supplement.

**L.M.S.R. Diesel train.**—The L.M.S.R. is to build at its Derby works a three-car articulated diesel-hydraulic train which is to be equipped with four Leyland oil engines and hydraulic torque converters, and which will have a driving axle on each bogie.

**More Diesel Cars for Italy.**—The Italian State Railways have ordered 25 oil-engined Littorina railcars, with buffets, from the Fiat Company. These cars will be powered by two 140 b.h.p. Fiat engines and will have the builder's own mechanical transmission. Fiat is also building some 950 mm. gauge cars of the same power for the Eritrean Railways.

**Swiss Railcar Service.**—The 290 b.h.p. diesel-mechanical railcar of the Swiss Federal Railways described in the issue of this Supplement for January 24 is still working over the Lyss-Lausanne section. In the summer timetables it is shown as starting from Payerne at 5.46 and finishing at the same place at 22.40 after covering a mileage of about 350. There is one stay at Lausanne of 94 min. and another at the same place of 57 min., otherwise the turn-round times are of the order of 3 to 25 min.

**" Green Diamond " Schedule.**—The schedule of the Illinois Central's streamlined diesel train, the *Green Diamond*, described in the issue of this Supplement for May 15, is 293 min. running time for the 294·2 miles from Chicago to St. Louis. There are six intermediate stops, and the respective start-to-stop averages are 43·7 and 28·0 m.p.h. in the suburbs of Chicago; 69·1 m.p.h.; 69·5 m.p.h. (over 92·7 miles); 64·7 m.p.h.; 51·8 m.p.h.; and 54·3 m.p.h. In the reverse direction the total running time is the same but there is a booking of 70·2 m.p.h. over a distance of 38·6 miles.

**New German Streamlined Trains.**—It is reported that the Reichsbahn has placed an order for three triple-car streamlined diesel-electric trains, but in contradistinction to the 14 two-car and 4 three-car articulated trains in service only one engine per rake will be used in place of two. The engines for the new trains will be of the supercharged four-stroke M.A.N. with eight cylinders 300 mm. bore by 380 mm. stroke. They will run at 700 r.p.m. and will have a maximum output of 1,300 r.p.m. All the power equipment will be located in the centre car. A further difference is that the cars will each be supported on two bogies and close-coupled to their neighbour.

**Etat Railcar Services.**—The French State Railways now have in service 83 diesel railcars, of which 43 are of the Renault double-bogie types of 250 or 265 b.h.p. These Renault cars cover a distance of 12,800 km. (8,000 miles) a day, equivalent to 300 km. (186 miles) per car, including those in reserve or under repair, and the total distance covered by these vehicles amounts to more than 3,300,000 km. (2,050,000 miles). The six double-engined, 210-b.h.p. De Dietrich cars cover an aggregate distance of 1,400 km. (875 miles) daily. The four-wheeled cars owned by the six big French railway systems have shown an average total operating cost of 3·7 to 4·0 fr. (7·2d. to 7·8d. at par or 12·0d. to 13·0d. at the present rate of exchange) per km., including everything except a proportion of the shed charges, and the double-bogie cars 4·0 to 5·0 fr. (7·8d. to 9·7d. at par or 14·0d. to 16·2d. at present rate).